Scientific American.

THE ADVOCATE OF INDUSTRY AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOL. 2. NEW YORK, NOVEMBER 21, 1846. NO. 9.

THE NEW YORK
SCIENTIFIC AMERICAN:
Published Weekly at 128 Fulton Street, (Sun Building,) New York.
BY MUNN & COMPANY.

RUFUS PORTER, EDITOR.

TERMS.—$2 a year—$1 in advance, and the remainder in 6 months.

☞ *See Advertisement on last page.*

THE WIFE'S APPEAL.

A TEMPERANCE SONG.

Winter—A street outside an Alehouse—A working Man, his Wife and Child.

Oh, don't go in to-night, John—
Now, husband, don't go in!
To spend our only shilling John,
Would be a cruel sin.
There's not a loaf at home, John—
There's not a coal, you know—
Though with hunger I am faint, John,
And cold comes down the snow:
Then don't go in to-night!

Ah, John, you must remember—
And John I cant forget
When never foot of yours, John,
Was in the alehouse set.
Ah, those were happy times, John,
No quarrels then we knew,
And none were happier in our lane
Than I, dear John and you;
Then don't go in to-night!

You will not go? John, John, I mind,
When we were courting, few
Had arm as strong, or step as firm,
Or cheek as red as you,
But drink has stolen your strength, John,
And paled your cheek to white,
Has tottering made your young, firm tread,
And bowed your manly height,
You'll not go in to-night?

You'll not go in?—Think on the day
That made me, John, your wife,
What pleasant talk that day we had
Of all our future life!
Of how your steady earnings, John,
No wasting should consume,
But weekly some new comfort bring
To deck our happy room;
Then don't go in to-night!

To see us, John, as then we dressed,
So tidy, clean and neat,
Brought out all eyes to follow us
As we went down the street,
Ah, little thought our neighbors then,
And we as little thought,
That ever, John, to rags like these
By drink we should be brought;
You wont go in to-night!

And will you go? If not for me,
Yet for your baby stay;
You know John, not a taste of food
Has passed my lips to-day;
And tell your father, little one,
'Tis mine your life hangs on,
You will not spend the shilling, John,
You'll give it him? Come John,
Come home with us to-night?

The Fancy Museam.

The only curiosities worthy of notice, which have been recently added to the collection, are

A knife handle made of the "bone of contention."

Dried samples of the "peels of laughter."

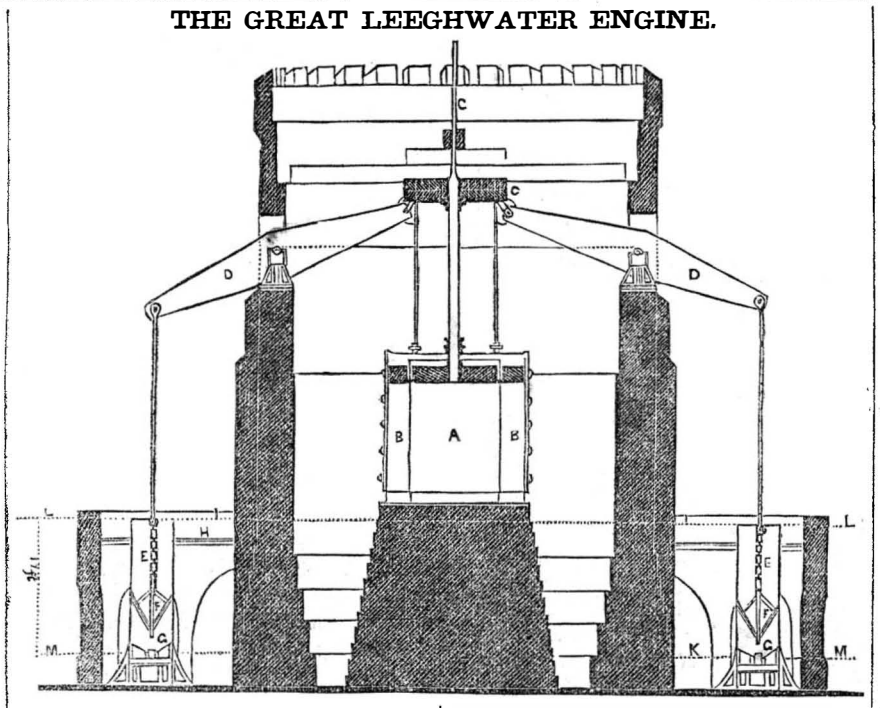
A joke carried too far, badly worn.

A cord made of the thread of a discourse.

A few links from the chain of circumstances.

A stray leaf from the book of fate.

THE GREAT LEEGHWATER ENGINE.



A large portion of the best land in the Netherlands, is several feet lower than the surface of the ocean at high water, and requires much expense to keep it from being overflowed. The Lake of Haarlem covers about 70 square miles, and arrangements have been made, and machinery prepared for draining and reducing this surface to dry land and cultivated fields. The water of the lake is far below the lowest practieable point of sluiceage, and the quantity to be lifted by mechanical means, is estimated at 1,000,000,000 tons.

With the exception of a few small steam engines, the wind has hitherto been the motive power employed to work the hydraulic machines used in the Netherlands to keep the country dry. And the power of 12,000 wind mills having an average power of 60,000 horses, is required to prevent the kingdom of the Netherlands from returning to the state of morass and lake, from which the indomitable energy and perseverance of the Dutch people have rescued what is now the most fertile country in Europe.

In 1840 it was found that the average consumption of coals by the steam engines used in England and Holland for draining land was 15 lbs, per net horse power, per hour.

The Harlemmer Meer Commissioners were convinced that the old means must be put aside, and new ones adopted to suit the magnitude and peculiarities of their work. Accordingly, they determined to erect three gigantic steam engines (from the designs of their engineers, Messrs. Joseph Gibbs and Arthur Dean, of London,) of a peculiar construction.

The first of these engines, called the Leeghwater, was completed last year, and has been experimentally used during several months.—The result has been most satisfactory to the Commissioners—the consumption of coal has been reduced to two and a half pounds per horse power, per hour, or one-sixth part only of the average consumption of the ordinary draining engines; nor has the performance of the engine, as regards the quantity lifted, been less successful; it will raise 112 tons of water 10 feet high at each stroke, and is capable of discharging 1,000,000 tons in 25 1-2 hours.

A short description of the Leeghwater engine may prove interesting to our readers; we have, therefore, engraved a diagram of the engine and pumps. It has two steam eylinders, one of 84 inches diameter, A, placed within another of 144 inches diameter, B B, both are fitted with pistons; the outer piston is of coarse annular, and the two pistons are united to a great cross-head or cap, C, which is furnished with a guide rod or spindle *c*; both pistons and cross-head are fitted with iron plates, and together, with the parts of the engine attached, have an effective weight of nearly 90 tons.

The engine house is a circular tower, on the walls of which are arranged 11 large cast iron balance-beams, which radiate from the centre of the Engine. Their inner ends, furnished with rollers, are brought under the circular body of the great cap, and their outer ends are connected to the pistons of 11 pumps of 63 inches diameter each; the stroke of both ends is ten feet; and the discharge from the pumps 66 cubic metres, or tons, of water per stroke.

The action of the Engine is very simple; it is on the high-pressure-expansive-condensing principle.

The steam is admitted first beneath the small piston; and the dead weight of 90 tons is lifted, carrying with it the inner end of the pump balances D, and of course allowing the pistons to descend in the pumps E.

The equilibrium valve then opens, and the steam in A passes round to the upper surface of the small, and annular pistons, puts the former in a state of equilibrim, and presses with two-thirds of its force upon the annular piston beneath which a vacuum is always maintained—thus, the down stroke of the Engine and the elevation of the pump pistons (F) and water, is produced by the joint action of the descending dead weight in the cap and pistons, and the pressure of steam on the annular piston.

The steam is expanded from six to eight times its original volume.

The Engine has two air-pumps of 40 inches diameter and 5 feet stroke each.

The water is lifted by the pumps into the canal H from which it passes off towards the sea sluices.

The total weight of iron employed for the Engine pumps &c., is 640 tons.

The cost of the machinery and buildings, £36,000.

Two other Engines of equal size and power are now being constructed by Messrs: Harvey, of Hayle, and Messrs. Fox & Co., of Perran, in Cornwall, who also manufactured the Leeghwater.

The united action of the three Engines will discharge about 2,800,000 tons of water per 24 hours, and, allowing for contingencies, the Lake will be pumped out in about 400 days, at a total cost, including the price of the Engines, buildings &c., not exceeding £140,000. By the old system of Steam Engines the cost would have exceeded £240,000: and to do the same work in four years, by wind would require 114 first class windmills, at a cost of £380,000.

A LIST OF PATENTS

Issued from the 26th of September to the 7th of October, 1846, inclusive.

To Jacob Cornelison, of Danville, Penn., for improvement in Cooking Steves. Patented 26th Sept., 1846.

To Benjamin Norton, of Boonton. N. J., for improvement in machinery for Rolling Hoop Iron. Patented 26th Sept. 1846.

To Kasson Frazer, of Fayetteville, N. Y., for improvement in Hames for Harness. Patented 26th September, 1846.

To William W. Allcott, of Boston, for improvement in Kiln-drying Grain. Patented 26th September, 1846.

To Elijah Chapman, of Akron, Ohio, for improvement in Carriage Brakes. Patented 26th Sept., 1846.

To James Miller, of Philadelphia, Penn., for improvement in Rotary Engines. Patented 26th Sept., 1846.

To John Howard, of Adrian, Mich., for improvement in Kiln-drying Grain, &c. Patented 26th Sept., 1846.

To Charles Bishop, of Newtown, Ct., for improvement in Carding Machines. Patented 26th Sept., 1846.

To William Mason of Taunton, Mass., for improvement in Self-acting Mules. Patented 3d Oct., 1846.

To James T. Wade, of Augusta, Geo., for improvement in Straw Cutters. Patented 3d Oct. 1846.

To Carl V. Ganahl, of Imsbruck, Austria, for improvement in Ribbon Looms, (assigned to Francis Ganahl, of New Orleans.) Patented 3d Oct., 1846.

To Deming Jarves, of Boston, Mass. for improvement in Glass Furnaces. Patented 3d Oct., 1846.

To Waldon Eddy, of Easton, and John A. Taplin, of Fishkill, N. Y., for improvement in Threshing Machines. Patented 3d Oct. 1846.

To Henry M. Paine, of North Oxford, Mass. for improvement in Glass Lenses. Patented 3d Oct. 1846.

To James M. Winslow, of Campbell's Port, for improvement in Lath Cutting Machines. Patented 3d Oct. 1846.

To Charles Fanshaw, of New York City, for improvement in Neck Stocks. Patented 3d Oct. 1846.

To Georges Michiels, of Paris, Franee, for improvement in the manufacture of Gas.—Patented 3d Oct. 1846.

To Georges Michiels, of Guadaloupe, Island of Guadaloupe, for improvement in Making Sugar, Patented 3d Oct. 1846.

To John M. Schrock, of Millersburg, Ohio, and John G. Fisher, of Quincy, Ill., for improvement in Clocks. Patented 3d Oct. 1846.

To William Sedgwick and John Brooks, of Poughkeepsie, N. Y., for improvement in Fruit Gatherers. Patented 3d Oct. 1846.

To William Taylor, of Berlin, N. Y,, for improvement in Boot Crimps. Patented 3d Oct. 1836.

To William J. Rylander, of Columbus, Geo., for improvement in Straw Cutters. Patented 3d Oct. 1846.

To David and Esaias Little of Gettysburg, Pa., for improvement in Carriage Steps. Patented 7th Oct. 1846.

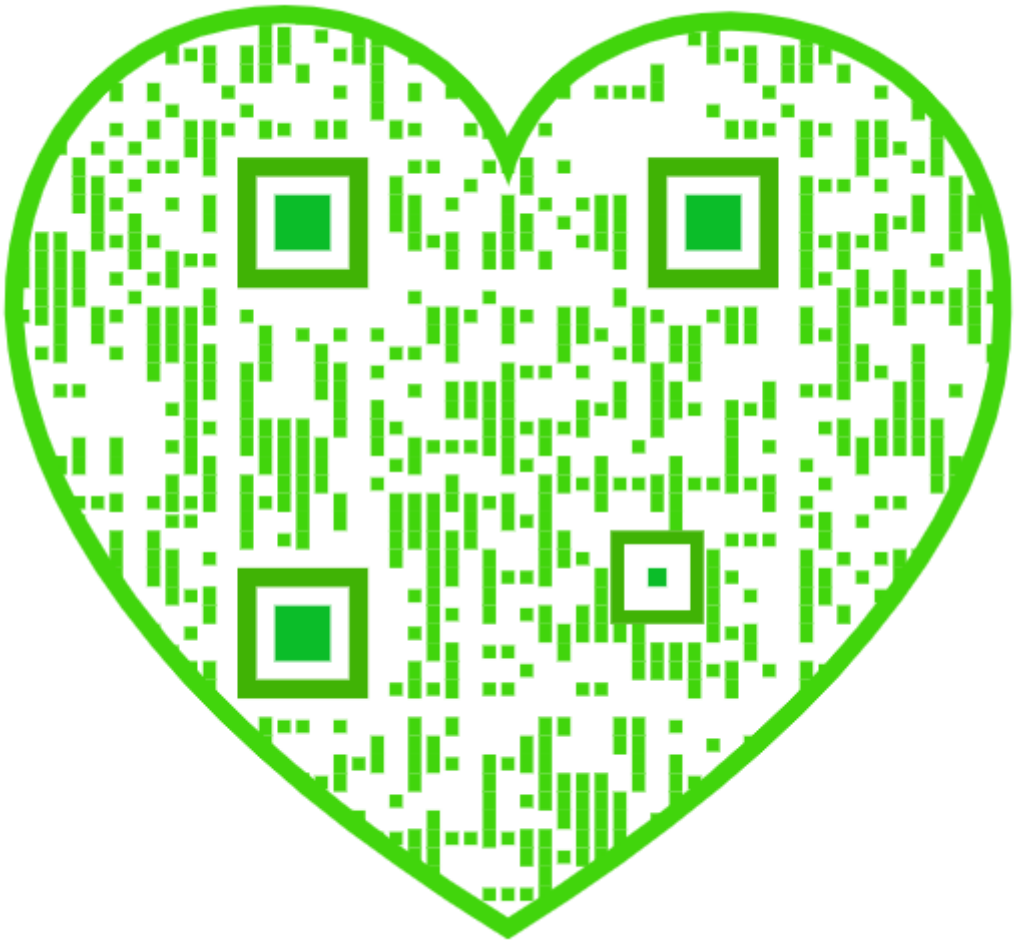
To Charles W. Grannis, of Collins, N. Y., for improvement in Fire Engines. Patented 7th Oct. 1846.

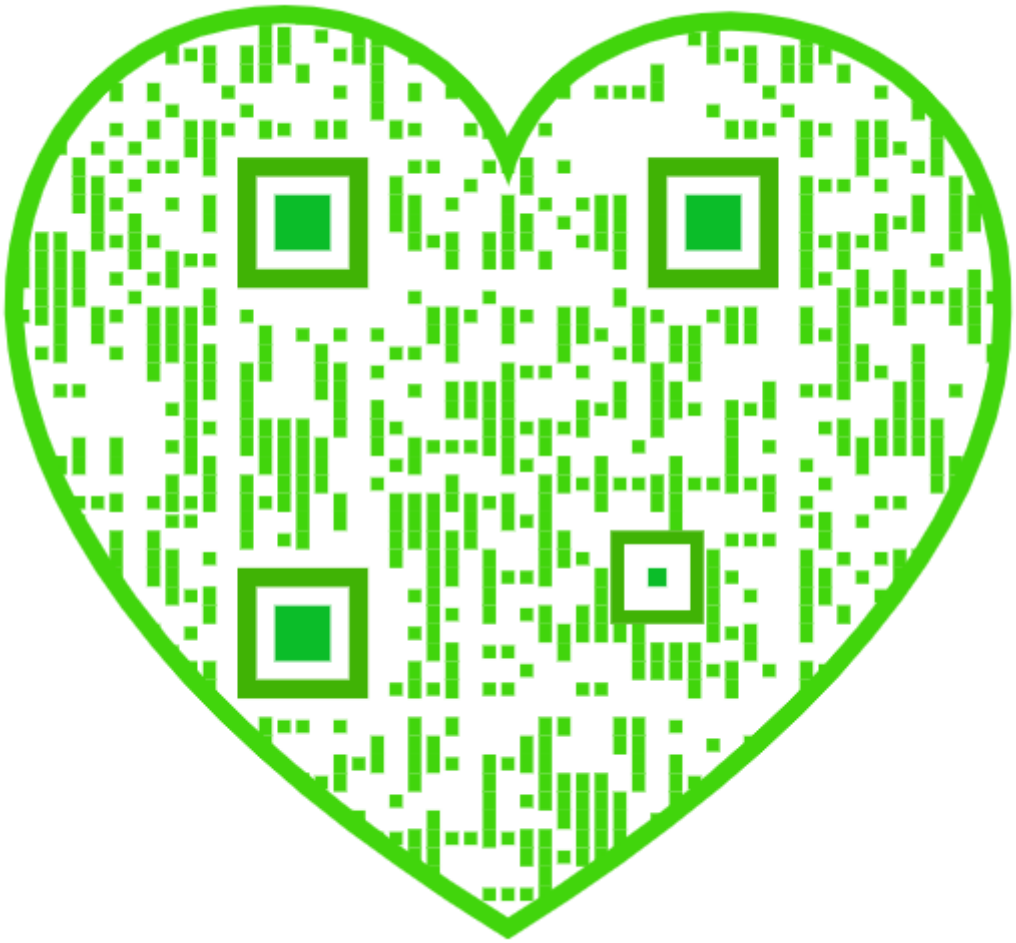
To William H. Passmore, of North Wayne, Me., for improvement in Tempering Furnaces. Patented 7th Oct. 1846.

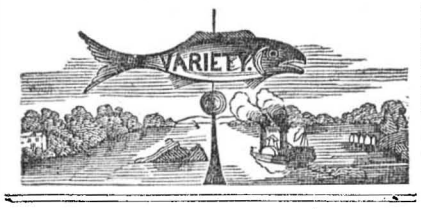
To Orlando Owen, of Burlington, Vt., for improvement in Apparatus for Constructing Cisterns. Patented 7th Oct. 1846.

To H. B. Masser of Sunbury, Penn., for improvement in Washing Machines. Patented 7th Oct. 1846.

© 1846 SCIENTIFIC AMERICAN, INC







MY THOUGHTS.

Many are the thoughts that come to me
In my lonely musing :
And they drift so strange and swift,
There's no time for choosing,
Which to follow—for to leave
Any seems a losing.

When they come, they come in flocks,
As on glancing feather,
Startled birds rise, one by one,
In autumnal weather,
Waking one another up
From the sheltering heather.

Some so merry that I laugh ;
Some are grave and serious ;
Some so trite, their last approach
Is enough to weary us ;
Others flit like midnight ghosts,
Shrouded and mysterious.

There are thoughts that o'er me steal,
Like the day when dawning ;
Great thoughts winged with melody,
Common utterance scorning ;
Moving in an inward tune,
And an inward morning.

Some have dark and drooping wings,
Children all of sorrow ;
Some are gay as if to-day
Could see no cloudy morrow—
And yet like light and shade, they each
Must from the other borrow.

THE FARMER TURNED SOLDIER.

My father was a farmer good,
With corn and beef in plenty ;
I mowed and hoed, and held the plough
And longed for one-and-twenty.

For I had quite a martial turn,
And scorned the lowing cattle ;
I burned to wear a uniform,
Hear drums, and see a battle.

My birth-day came ; my father urged,
But stoutly I resisted ;
My sister wept, my mother prayed,
But off I went and listed.

They marched me on through wet and dry,
To tunes more loud than charming,
But lugging knapsack, box and gun,
Was harder work than farming.

We met the foe—the cannons roared,
The crimson tide was flowing,
The frightful death-groans filled my ears,
I wished that I was mowing.

I lost my leg—the foe came on,
They had me in their clutches ;
I starved in prison till the peace,
Then hobbled home on crutches.

Who is a Coward ?

The man who attacks another by surprise, or with a weapon in his hand when the other has none is a coward.

The man who carries deadly weapons about his person in his intercourse with an unarmed society is a coward.

The man who associates and goes with numbers to overpower an individual, is a coward.

The man who, challenged to a duel, is so much afraid of public sentiment that he dares not refuse it, is a coward.

In general that man is a coward who shapes his course of action by his fears; and he alone is a man of real courage who always dares to do right.

Virginia Figs.

The ladies of a family in Chesterfield, Virginia, have gathered, dried and packed figs nicer, fresher and better flavored than the imported article.

There are two shoemakers living on one street in Pittsburg, whose names are Gschwind and Ochse. It is said to be difficult to pronounce the latter name without sneezing.

Dancing Prohibited.

The Synod of Cincinnatti decided at its recent session that dancing in public assemblies is inconsistent with the Christian character.—David of old did not think so. However, no Christian could approve of dancing as ordinarily conducted, but there is an evident disposition prevailing among the popular clergy to paint religion in colors of dismal gloom, instead of representing it as a joyful and cheerful subject as it truly is. Spiritual pride and morose dignity and exclusiveness are not the leading features of the Christian religion, as modern customs would seem to indicate.

The White Mice.

There are several little boys in this city—very interesting boys some of them are—who have apparently no other means of procuring subsistance than by the exhibition of a few little innocent white mice. These mice are about half the size of the common mouse, have red eyes and are very active The boys have no regular price for the exhibition, leaving that to the generosity of their customers, and one of the boys occasionally puts a mouse into his mouth, to which it appears to have no objection.

Modern Consistency.

In a public building on Blackwell's Island, there is a staircase in the central octagon tower, which cost $20,000. In another instance, $70,000 have been expended in the construction of extravagantly elegant buildings for a charitable institution : and yet the same people who approved of this extravagant expense, are willing not only to furnish the poor paupers with the cheapest kind of food and lodging, but to exclude hundreds who are coatless and shoeless, and nearly dying of hunger.

A Mule Boat on Fire.

There are several boats on the Western rivers which are propelled by the power of mules instead of steam. One of these, the 'Ole Bull,' caught fire a few days ago, when the intrepid steersman put the oar hard down at the stern, kicked the mules into a gallop, and run in along side of shore, where, after great exertions, the conflagration was stopped but not until it burned fifteen barrels of flour and twenty or thirty sacks of wheat.

Albany Knickerbocker.

If any of our readers want a real lively, sprightly, and ever interesting daily, we would recommend the Knickerbocker in preference to all others. Nevertheless we have some things against it: we want to see it daily, but do not receive only three or four numbers a week If Mr. Hastings does not in future send it daily, we will say it is a bad paper and advise our readers to have nothing to do with it.

A Rare Case.

A clergyman in Pittsburg feeling that his salary was more than enough, applied to his congregation to have it reduced. This they refused to do, and the clergyman annually contributes a large portion of his salary for benevolent purposes.

Successful Sport.

A party of five gentlemen from St. Louis, went lately on a hunting excursion in St Charles County, Mo., and in a few days they sent home two hundred and twenty four ducks besides other game, and continued the sport, the result of which we have seen reported.

A Flourishing School.

It is stated in the Northampton Courier that the number of pupils in the Mt. Holyoke Female Seminary, at the present time, exceeds *two hundred.*

Railroad Speed.

In England the distance between London and Exeter via Bristol, 220 miles, is regularly run over in *four hours* and a half. Can not the Yankees overtake the Bulls ? We *guess* they'll try.

Very Kind.

A lady in Albany is said to be so kind hearted that when her servants do wrong, instead of scolding, she requests her husband to write a reprimand for them, and sends a little black boy to read it to them.

A political editor announces the election of the candidate of his opponents, under the head of "the Pork Market."

RAILROAD INTELLIGENCE.

Michigan Central Railroad.

James W. Brooks, the Superintendent of this road under the new organization, has just completed a contract in New Jersey and Pennsylvania, for a thousand tons of heavy T rails —sufficient for one hundred miles of road.—Fifty miles of the eastern section of the road will be relaid within 6 months, and the whole work completed through to Lake Michigan in two years.

New York and New Haven Railroad.

We learn from the Journal of Commerce that a contract has been made for the construction of this Railroad, and that $1,900,000 of the stock taken without reserve, on condition that the remaining $600,000 shall be subscribed within a specified period. The terms of the contract require the entire work to be completed in one year from the 1st of January next.

It is reported that the contract for building this road has been taken, at $31,000 per mile. The distance from New Haven to the junction of the Harlem, is 63 miles.

Cleveland, Columbus and Cincinnati Rail Road.

The Board of Directors have advertised for proposals for building forty miles of this road. The "Plain Dealer" says : "Forty miles only is proposed to be let at present, because the directors do not choose to incur liabilities one cent beyond their actual means to pay. This completed, and there will be funds enough seeking investment in its continuance. There will be nothing to hinder the work commencing on the 1st of December. We look with entire confidence and certainty to the completion of this road, and that too in a very short space of time."

Connecticut River Railroad.

The bridge across the Deerfield River is supposed to be completed by this time, and the cars now running to Greenfield. Two new and heavy engines have been added to the road, making the whole number six.

Cape Cod Branch.

It is stated that the subscription to the Cape Cod railroad has reached $300,000, and that the road will be immediately located and placed under contract.

Opening of the Cambridge and Lexington Railroad.

This road has been for several days in full operation. The opening of the road was celebrated by a grand ride thereon, by the stockholders and a large number of invited guests, including a sufficient number of Boston editors to make and publish a good account of the affair. About 500 persons dined at the Lexington depot.

The Central Railroad.

The Common Council of Philadelphia have passed an ordinance appropriating funds sufficient to subscribe for 30,000 shares of the Central Railroad, designed to connect that city with the Ohio River at Pittsburgh.

Shakers Wanted !

An Ohio farmer who has a large orchard wants to hire two or three men who have the *fever and ague* to shake his apples from the trees !

Singular Marriages.

A Western paper reports the marriage of a gentleman of 80 to a lady of 75. About the same time a Middletown, Pa., paper announces the marriage of Master David Turner aged 17 to Miss Almira Brown aged 14.

The Eagle's Flight.

We see it stated in an exchange paper that the Eagle can fly at the rate of one hundred and fifty miles an hour, wild geese ninety &c. This is incorrect, the flight of an eagle is not known to exceed 75 miles an hour and is seldom more than 60.

Emigration to Palestine.

Ten thousand Russian Jews are expected to arrive in the Holy Land to settle there. This number will add about a third to the Jewish population in Syria and Palestine.

The Casting Vote.

When the Hon. Geo. M. Dallas went to the poll on Tuesday last, a wit who was standing in the vicinity said, 'Step back gentleman here comes the casting vote.' Mr. Dallas himself was forced to smile.—*Phil. Sun.*

LATE FROM EUROPE.

The Steamship Great Britian arrived on Monday evening, 16 days from Liverpool.—The steamer Hibernia, with news of the capture of Monterey, arrived at Liverpool on the 29th ulto. Comments on the taking of Monterey appear in all the British journals. Some exult over the defence made by the Mexicans, but all unite in applauding the valor of the American forces and in complimenting "Old Rough and Ready," speaking of him as the legitimate successor of "Old Hickory."

The famishing condition of the people of Ireland is terriffic ; and has been aggravated in consequence of the tempests which have kept the vessels with food away from the shores.

In Paris there is great distress and stagnation of business, and scarcity of money ; the pawn brokers' shops are thronged with customers — Failures are of daily occurrence ; the Savings Banks are nearly empty, and the hospitals are full, and the prisons are full. The number of paupers in the city is estimated at 115,000.—The south of France has been visited with destructive inundations, which have swept off the property of whole districts, with many of the inhabitants into the ocean.

Spain.—On the return of the court to Madrid, the usual bull-fights took place, and the usual number of bulls and horses were killed. Ten bulls were slaughtered before her Majesty and the court ; on more than one occasion incidents occurred which would have tried the sensibilities of a Leadenhall butcher.—The French ambassador's ball on the 18th, went off very brilliantly, the Queen and Infanta being present.

Decidedly Cool.

A gentleman recently advertised in one of the city papers for board in a quiet, genteel family where there are two or three beautiful and accomplished young ladies, and, "where his *society* will be deemed a sufficient compensation for his board, washing, and other etceteras."

The force engaged under General Taylor a the battle of Monterey, were 4000 regulars, and 2000 volunteers ; those of Gen. Ampudia 7000 regulars and 4000 militia.

The Supreme Court of Connecticut at its late term at New Haven granted eleven petitions, ten of them by the wives for divorce, several of these were on the plea of three years wilful absence.

The falling of snow has already been noticed in various sections of this country, and it is thought by some that it will ere long be spoken of as a *common occurrence.*

Three-fourths of the territory of Mexico is said to be ostensibly and virtually in the possession of the United States. We shall restore it again—perhaps.

It is estimated that over *five hundred thousand* foreigners have emigrated to our country this year, three-fourths of whom are Roman Catholics.

There were 66 deaths in Boston in the week ending on the 7th inst., nearly one fourth of whom died of modern fashion, alias consumption.

A Roman Catholic common prayer book, of uncommon splendor, has been recently finished by a jeweller of this city. The binding and ornaments cost about *eighty dollars.*

There were seen about three weeks ago, a short distance below the mouth of the Ohio, twenty two steamboats, all within sight of each other at the same time.

The merchants of Cincinnati have pledged themselves not to patronise those steamboats which employ runners.

The proprietors of the Great Britian returned the passage money, amounting to about $30,000, to the passengers.

The official returns represent less than 160 Americans killed in the battle of Monterey—though several have died of their wounds.

© 1846 SCIENTIFIC AMERICAN, INC

Information to persons having business to transact at the Patent Office.

Concluded from No. 8.

FORM OF APPLICATION FOR PATENTS ON DESIGNS, UNDER THE ACT OF AUGUST 29, 1842.

To the Commissioner of Patents :

The petition of Sebastian Cabot, of Cabotsville, in the county of Hampden, and State of Massachusetts,

Respectfully represeuts:

That your petitioner has invented or produced [a new design or figure to be stamped or printed on fabrics, which, when thus printed, are termed calicoes,] which he verily believes has not been known prior to the production thereof by your petitioner. He therefore prays that letters patent of the United States may be granted to him therefor, vesting in him and his legal representatives the exclusive right to the same upon the terms and conditions expressed in the act of Congross in that case made and provided ; he having paid fifteen dollars into the Treasury, and complied with other provisions of the said act.

SEBASTIAN CABOT.

SPECIFICATION.

To all whom it may concern :

Be it known that I, Sebastian Cabot, of Cabotsville, in the county of Hampden, and State of Massachusetts, have invented or produced a new [design or figure to be printed on fabrics, which, when thus printed, are termed calicoes,] and I do hereby declare that the following is a full and exact description of the same.—[Here follows a description of the de. sign or figure with reference to the specimen, or to a drawing of it, in all cases which admit of representation by drawings.]

The specification to conclude with declaring what the inventor or producer claims to be expressed in terms which will give the character of the design, &c.

FORM OF OATH.

County of Hampden, State of Massachusetts, On this day of 184 , before the subscriber, a personally appeared the within named Sebastian Cabot, and made solemn oath [or affirmation as the case may be] that he verily believes himself to be the original and first inventor or producer of the design for figures to be printed on fabrics which, when thus printed, are termed calicoes ; and that he does not know or believe that the same was ever before known or used, and that he is a citizen of the United States.

Signed, A, B.

The phraseology of the title of this act having misled many persons, it is proper to add that it is an act in addition to the act of July 4, 1836, by which act all acts and parts of acts before made were *then* repealed. The title of the act of August 29, 1842, therefore, merely recites the title of the act of 1836.

EDMUND BURKE,
Commissioner of Patents.

Patent Office, May 7, 1845.

All communications should be addressed to the Commissioner of Patents.

In consequence of the numerous applications to this office for information, founded on brief descriptions of inventions, and asking in any given case, whether there exists any thing like the invention described, and whether a patent can be had therefor, it has become necessary to furnish the explanation following as a general reply to such inquiries.

By the act of July 4, 1836, entitled " An act to promote the useful arts, and to repeal all acts and parts of acts heretofore made for that purpose" a principle entirely new was engrafted on the system, under which patents had been previously granted.

Under the provisions of this act it was made the duty of the Commissioner of Patents, on the receipt of any application for a patent to institute " an examination of the alleged new invention or discovery," with a view to determine whether the same has been before " invented or discovered by any other person in this country," or patented or described in any printed publication in this or any foreign country." Thus was the grant of future patents restricted to such " inventions or discoveries" as were *new* in the most absolute sense of the term ; and a very laborious and responsible duty imposed upon this office. In aid of the solution of the question of *novelty*, thus raised on every application, the applicant was required to furnish a full and clear description of his invention, signed, witnessed and verified by his oath, accompanied by a model and drawings of the same : all being deemed necessary in order to illustrate his claim to a patent.—Furnished with these illustrations, the office was then required to go into a rigorous and extended examination, taking in the whole range of history on the given subject, whether its evidences were to be found in patents granted, caveats filed, or descriptions published, in this or in any foreign country, in any period of time.

In the conduct of these examinations, it is necessary to keep in constant and laborious employment a number ef persons specially selected for their knowledge and skill in the arts ; to refer with guarded care to the caveats filed in the secret archives of the office, and which can only come into view on such occasions ; to patents already granted, and to such works on the arts as have been published here or elsewhere : and also to keep pace with the current of invention throughout the world, by a constant and copious supply of such publications in this country and in Europe, as are devoted to this object.

It will readily be seen that this office cannot undertake to respond to the numerous inquiries constantly addressed to it, whether such or such an invention can be new, and whether a patent can be obtained for it. Because, 1st, Every such inquiry involves *the whole question of novelty* ; and before the office could express, or even form, an opinion, would require the same range of rigorous examination as is now required by law on a regular application for a patent, and this, too, without the necessary illustrations ; such inquiries being based on mere and usually very imperfect general descriptions ; while, in the case of application for patents, the law requires that the office shall have the aid, not only of clear and full description, under oath, but also accurate drawings and models, before it shall decide the question whether, in any given case, the invention be new, &c.

2d. The attempt to do so would effectually interrupt the appropriate business of the office, and be a direct infringement on the rights of those who apply for patents,—as the regular examinations of their applications must necessarily be suspended while the examinations required, in order to frame such answers, were being made.

3d. Every such inquiry does, in effect, require this office to prejudge a case before such case is presented : or, in other words, the inquirer asks the office to decide upon his invention before he has done that which the law requires he shall do, in order to obtain such decision.

4th. The law made no provision for such services. It is, therefore, no part of the legitimate duty of this office.

It is hoped that this explanation will prove satisfactory to all, and that it will be distinctly understood, that, in declining to respond to the class of inquiries above stated, this office acts under the mere necessity of the case, and not from any disposition to withhold information.

The records and models of the office are alwas open to inspection, and copies can readily be furnished on the receipt of the fee required by law.

MODELS.

SEC. 84. If deposited with any of the following agents, will be forwarded to the Patent Office, free of expense.

The Collector of the port of Portsmouth, N, H.
" " Portland, Maine.
" " Burlington, Vt.
" " Providence, R. I.
R. H. Eddy, agent at Boston, Mass.
The Surveyor at Hartford, Connecticut.
Edgar Irving, agent, custom house, N. Y.
The collector of the port of Philadelphia, Pa.
" " Baltimore, Md.
" " Richmond, Va.
" " Charleston, S. C.
" " Savannah, Geo.
" " New Orleans, La.
" " Detroit, Mich.
" " Buffalo, N. Y.
" " Cleveland, Ohio.
The Surveyor at St. Louis, Missouri.
The Surveyor at Pittsburg, Pa.
" Cincinnati, Ohio.
" Louisville, Ky.

SEC. 85. The transmission of models by the agents extends to those for new applications, as well as those restored in consequence of the destruction of the originals.

SEC. 86. N. B. Patentees, and the public in general, are urged to use their influence to aid the office in restoring the records of all patents and assignments on record before the fire in December, 1836. The same cannot be used in evidence unless *so recorded anew*. No expense is incurred. The papers are received and transmitted by mail.

EDMUND BURKE,
Commissioners of Patents.

CHEMISTRY.

Continued from No. 8.

HEAT OR CALORIC.

In our investigations of the phenomena of the material universe, we perceive two kinds of motion which result from the two principles *attraction* and *repulsion*. Of the former we have already spoken, and it only remains to say a few words upon the latter. Repulsion, like attraction, takes place both at sensible and insensible distances. The former is exemplified by the flying off of the same light bodies which have been first attracted, after they have been some time in contact with a piece of excited resin or glass, and also by the recession from each other of the two similar ends of two magnetized needles. Repulsion at insensible distances, which is chiefly excited by heat or, as it is called in chemical language, caloric, is exhibited in a great variety of phenomena.

The principle effects of heat are expansion, liquefaction, vaporization, evaporation and ignition. With few exceptions, bodies are capable of expansion by means of heat ; the gases being the most expansive, fluids less so, and solids least of all. When the iron rim of a coach or cart wheel is to be put on, it must first be heated to a considerable degree. The reason of this is obvious ; when hot, the circle is larger than when cold, and thus slips easily upon the wheel; as it cools the circle decreases and thus fimly binds the wood work together. The expansion of aeriform substances is illustrated by a bladder being partly filled with cold air and held before the fire. The air will swell out with the heat, and become in some instances so expanded as to burst the bladder. As regards fluid bodies the same fact is illustrated in the cases of the thermometer and barometer. By the accession or loss of heat, the alcohol or mercury expands or contracts, as shown by the index attached. The general law, therefore, is, that the expansion and contraction of matter are, with a few exceptions, dependent upon the increase and diminution of heat. The quantity or condition of heat that is discoverable by the thermometer or by the organs of sensation is called *temperature*. We are unacquainted with the extremes of temperature relative to heat or cold. It has been compared to a chain the extremities of which are concealed from view, whilst only a few of the middle links are exposed to observation. Although the universal result of an increase of temperature is an increase of bulk to the body thus subjected to heat, yet all bodies are not alike expanded by the application of the same quantity of heat. It of course follows as a general law that different bodies at equal temperatures do not contain the same quantities of caloric. This quality of matter is called the capacity of bodies for heat, and the quantity of heat which is necessary to raise any particular body to a certain temperature, is called its *specific* caloric. Heat, however in some cases, causes contraction instead of expansion. Thus water is of greater bulk at a temperature of 32 deg. (the freezing point) than it is at 39 1-2 deg, Some solids also as iron, antimony, bismuth and many salts contract when melted and expand as they become solid.

Vaporization is the rapid production of a thin vapor, as when water is converted into steam. The boiling point of water, in a vessel exposed to the ordinary atmospheric pressure, is 212 deg., and although more heat be applied to the vessel in which it is contained the temperature of the water is not increased. If this degree of heat be continued the watery particles seperate from each other and become steam or vapor. Steam is colorless, transparent and invisible, resembling the atmosphere and is 1696 times greater in bulk than water.—Steam may be condensed, or its particles brought nearer to each other, either by the heat which is the cause of the expulsion, or by mechanical pressure, and the result is its return to the form of water.

Water can be made to boil at a lower temperature than 212 deg. by removing the pressure of the air. If a flask be half filled with water, the water made to boil, and as the steam escapes, a cork be put into the mouth of the flask, upon the heat being removed, the water will continue to boil, the heat in it being sufficient for that purpose when there is no pressure from the air. If the flask be put into cold water the boiling will increase, from the steam being more effectually condensed, whereas, if the flask be put into boiling water, so as to prevent the condensation of the steam, the ebulition will immediately cease. Steam, as is well known, from its great force and the manner in which it can be applied to propelling machinery, is of great usefulness in manufactures.

Distillation is the converting of a liquid into vapor, which is afterwards carried off through a pipe and condensed in what is called a refrigerator. This is a vessel filled with cold water, round the inside of which the pipe is wound; and as the vapor passes through the pipe it is condensed by the lower temperature of the water.

Liquid substances give off vapor from their surface at temperatures below the boiling point, which is termed *evaporation*. It is called spontaneous evaporation when this takes place at the ordinary temperature of the atmosphere. A large quantity of vapor is given off from the surface of the earth and sea which eventually forms clouds or is condensed into rain or dew. Evaporation always produces cold when heat is not applied ; the heat necessary for it being derived from surrounding objects. A current of air or a higher temperature tends greatly to quicken evaporation, as may be observed in the rapidity with which the surface of the earth dries when a brisk wind passes over it.

All substances becomes luminous when heated to 800 deg. in the dark and 1000 deg. in daylight unless they are converted into vapor at a less elevated temperature. The light is red at first and in this state a body is said to be in a state of *ignition*. If more heat is applied the body becomes white when it is said to be *incandescent*.

When a body changes from the solid to the fluid state, there is a quantity of heat absorbed which has no effect in raising the temperature. This has been called *latent* heat, a discovery effected by Dr. Black, and which we shall shortly explain. For a demonstration of this doctrine we may have recourse to water. If ice at a temperature below 32 deg. be exposed to a warmer atmosphere it receives caloric, and gradually rises to that point of the theometrical scale. But as soon as it reaches it, the rise of temperature ceases, the ice begins to melt and during the whole period of its liquefaction its temperature, as also that of the water flowing from it, remains stationary at 32 deg. It is evident that, as caloric has contined to be communicated, a quantity of it has disappeared, and become absorbed during the fusion. The same phenomenon takes place when a fluid is converted into vapor; and the inference drawn from it is, that when a body passes from one state into another, a quantity of heat or caloric is lost, becomes latent, or passes into the body without raising its temperature. Dr. Black was of opinion that this latent heat become chemically combined with the solid and was the cause of fluidity. Dr. Irvine, his pupil, took a different view of the subject. He supposed that the absorption of heat into the latent state is not the cause of liquifaction and vaporization, but the effect — The absorption he attributed to what is called change of capacity for heat, or that quality of matter which causes one kind to be more or less heated than another by the addition of the same quantity of heat. He concluded as a general law that the capacity of all solids for heat is increased by fusion, and that of all fluids by evaporization. It is impossible to enter further into this interesting subject at present, but, before quitting it, we may mention an exception to the law of expansion by heat in the case of water. (*To be continued.*)

© 1846 SCIENTIFIC AMERICAN, INC

NEW INVENTIONS.

Improvement in Bridges.

This invention was entered on the 4th inst., by Lowman Gay. Tne improvement consists in the method of bracing together the upper and lower arch pieces of the arch trusses which are connected to each other with rods or posts, by connecting the ends of the braces with the arch pins, at a sufficient distance from the rods or posts, and from each succeeding brace to cause the parts of the arch-pieces between the ends of the brace, to act as levers to transfer the strain from one brace to another, throughout the series This bridge is also supported against a lateral pressure by means of two diagonal trusses connected together at the top.

New Railroad Invention.

Mr. Joseph Grenell, of Newark, N. J., has invented and patented an improvement in the method of constructing the rails of railroads, which, it is said, promises to reduce the cost, and at the same time increase their stability and security. The plan, among other advantages, allows of the same rail being used on one edge first, and when that is worn, to be reversed from side to side, and when worn on one surface to be changed top and bottom, and again reversed; by this he has four wearing sides or surfaces, to one rail. The mode of fastening the ends of the rails together, affords perfect security against looseness.

Improvement in Tide Mills.

This invention consists in the construction and arrangement of two gates in such a manner that either the ebb or flood tide will act on the water wheel in such a manner as to turn it in the same direction. This arrangement of gates is claimed in combination with a water wheel, though we are not informed what particular kind of a water wheel is preferred. We think this an ingenious and useful invention.

Improvement in ever pointed Pencils.

Mr. A. G. Bagley of this, city has applied for patent for an improvement which consists of the mode of forming a reserve for leads in the outer, or revolving cylinder, by cutting grooves in the periphery of the latter, and covering them with an outer coating of silver or other metal. Entered Nov. 6th.

Improvement in Shower Baths.

An improvement invented by Horace Wells, and entered at the Patent Office, Nov. 4th, is so constructed as to avoid the necessity of elevating a font or reservoir of water; but by simply operating a treadle, or pair of treadles with the feet, a pump is put in operation which raises a supply of water for a shower.

Improvement in Glass Furnaces.

This improvement consists in extending the fire place and flame chamber entirely around, so as to encompass the melting pot, instead of placing the fire place on one side of the pot, as is the custom in ordinary glass houses. Invented by Demming Jarvis,—entered Oct. 3.

The following are the claims of inventors to new inventions and improvements, which have been entered at the Patent Office within a few days.

BY WILLIAM MASON.

Oct. 3d, 1845.

Improvement in Self-acting Mules.

Claim: the disconnecting of the mechanism employed in running out the carriage and turning the draw rollers from the mechanism which gives the wheeling or spinning motion to the spindles when the driving power is shifted from these the first series of motions to enable the spindles to continue their motion by inertia independent of the other motions, by means of the clutch box or its equivalent, which forms the connection between the three movements, constituting the first series of motions, whereby the momentum of the spindles can be employed for preparing the parts for the backing off motion. 2d: the method of preparing the parts for the backing off motion by means of the momentum of the spindles, by connecting them with the backing off apparatus by means of the friction clutch or any equivalent therefor. 3d: the backing off apparatus consisting of the combination of the topsliding rack, which communicates motion to the spindles, the rocking shaft, with its cam and spring brake, and other appendages, and the connecting rod operated by the crank. 4th: the method of decreasing the backing off motion to correspond with the increased length of the cops by means of the slide in the intermediate arm of the connecting rod [between the two sections of the connecting rod] by means of which the rocking motion of the rock shaft is gradually decreased. 5th: combining the train of wheels which actuate the backing off motion of the carriage by means of a clutch which starts the carriage, whether this be effected by a clutch or by any other means substantially the same. 6th: running in the carriage by means of a crank motion which actuates a sliding rack that communicates the desired motion to the carriage so as to start and arrest it gradually, to avoid any sudden strain or jar upon the threads. 7th: the method of communicating the winding on motion to the spindles from the main rack which runs in the carriage, by combining the said main rack with the top sliding rack by means of a chain and scroll cam, or their equivalents, by means of such combination, in connection with the form of the cam, the motions of the spindles so correspond with that of the carriage as to wind the threads on the conical forms of the cops. 8th:—the method of varying the winding on motion of the spindles to form the base of the cops by means of the slide and chain which vary the motions of the wheel, that is attached to, and which rotates the scroll cam, whether the slide be operated by the vibration of the arm on which it slides or by any other means. 9th:—the method of regulating the motion of the slide that varies the motion of the scroll cam of the winding on motion, by means of what is termed the butterfly and its appendages, when this is acted upon by the counter faller operated by the tension of the threads. And 10th:—the method of winding on the thread tighter at the points of the cops when finishing them by means of the apparatus which gives to the top sliding rack an increased motion towards the end of the operation, the said apparatus consisting of a chain which is connected with the chain which forms the connexion between the main and top rack, and which is gradually wound up and strikes against an arm towards the ends of the operations of the mule to shorten the connection between the two racks and thus increase the winding on motion of the spindles.

—

BY BENJAMIN F. PALMER.

Nov. 4th, 1846.

Improvement in Artificial Legs.

What I claim is the long tendon, the spring and the cord respectively combined and acting upon the parts. I also claim the manner of forming the knee joint, uniting the parts to each other by means of the hemisphere at the lower end, the partial concave levelled to a thin edge on the front side of the upper end, and the pivot; for the purpose of obviating noise or friction in working the joint and producing a perfect contour thereof. I also claim the improved manner of forming the ankle joint, uniting the parts to each other, the rear side of the lower end being levelled to a thin edge passing over and enclosing the heel portion of that part in the rear of the front pivot, and the front upper part being brought to a thin edge and overlapping the lower end of the front side; thus forming a pliable joint that will work without noise and preserve its contour in all positions.

—

BY JAMES SLAUGHTER.

Nov. 4th, 1846.

Improvement in machine for Cleaning Chimnies.

What I claim is the combination of Scrapers, Brushes and Cars.

—

BY ALEXANDER D. M'KENZIE.

Nov 6th, 1846.

Improvement in printing in Colors.

What I claim is the combination of a series of tympans with a corresponding series of plates for printing colors, so that a sheet when put into the machine shall receive successively an impression from each plate, the whole forming a variecolored impression.

—

BY JACOB J. HATCHER.

Nov. 6th, 1846.

Improvement in Pens and Pencil Cases.

What I claim is combining the penholder in the same case with the pencil holder, by means of the sliding tubes combined and operating with the main tube.

—

BY WILLIAM CUNDELL.

Nov. 10th, 1846.

Improvement in machinery for making guards for Cap Spinners.

What I claim is, first, the combination die, the bender and the cylindrical die; and second, the permanent die, the cylindrical die, and the segmental former.

—

BY HUGH K. WAGNER.

Nov. 10th, 1846.

Improvement in Dry Docks.

I claim the moveable levers, in combination with the dry dock, as the most important and substantial part of my invention and improvement, and disclaim all other parts of the dock.

BY HIRAM MUNGER.

Nov. 10th 1846.

Improvement in Water Wheels.

What I claim is the employment of a wheel having the shrouding extended out to the periphery of the buckets which are open inside and outside when combined with a three or more sided flume surrounding it, which flume is provided with a shute on each face to discharge the water on to the wheel outside at given distances apart leaving sufficient room between the shutes for the discharge of the water in tangential lines from the outside of the buckets, whereby the water is discharged mainly from the outside of the buckets when the wheel moves with a velocity equal or nearly equal to that of the water by which it is impelled and mainly inside when it is loaded and moves much slower than the water by which it is impelled.

—

THEODORE R. TIMBY.

Nov. 10th, 1846.

Improvement in Water Wheels.

I claim making the two rims or flanches that overlay each other so as to constitute the two passages and issues for the water, with their inner surface of the gradual decreasing eccentric surfaces as its motion from the centre of the wheel is gradually diminished, at the same time gradually decreasing the width of the passages between the flanches inversely as their length is increased by the increased diameter. And I also claim making the outer extremity seperate from the rims or flanches so that they can be removed and others of different lengths substituted, that the wheel may be adapted to the varying capacity of the column of water.

—

H. & L. J. LAMB.

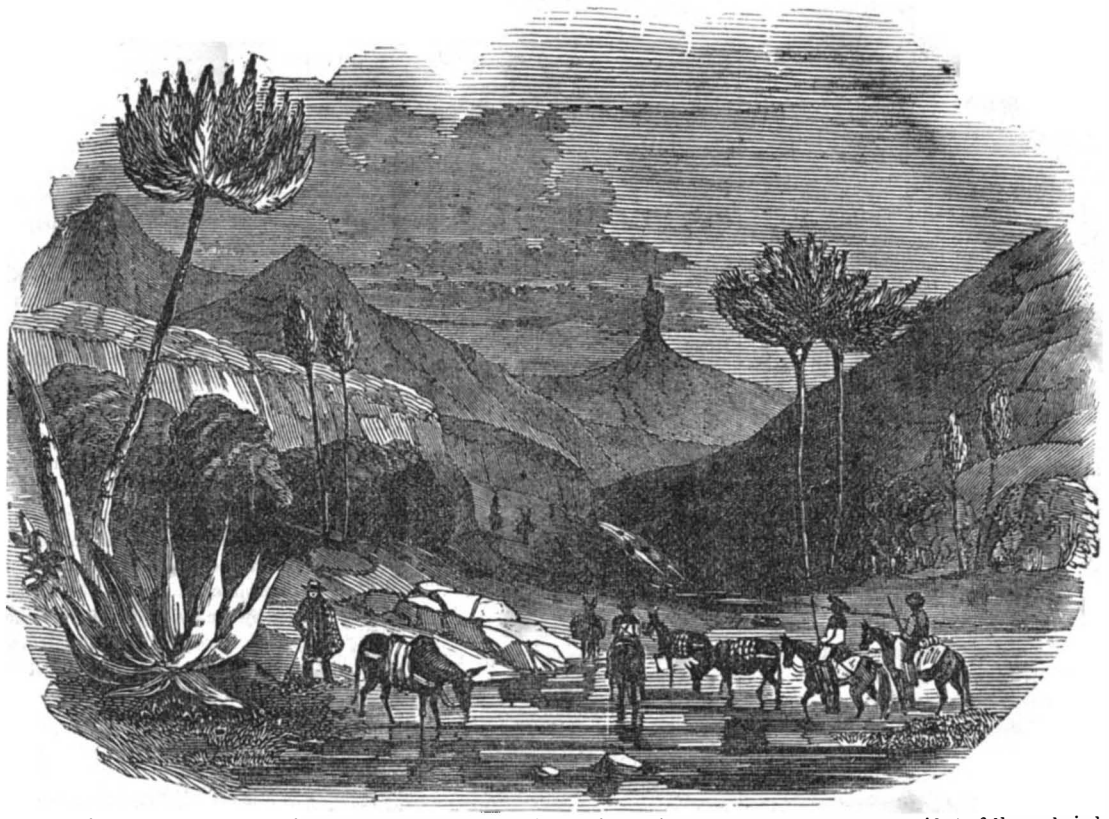
Nov. 10th, 1846.

Improvement in Rotary Shears.

What we claim is the inclination of the two arbors of the rotating shears to the plane of the plate to be sheared, so as to leave a free passage for that part of the sheet that is being cut off, in combination with the levelled face of one of the shears. We also claim the mode of setting the cutting edges of the shears to each other, by having the arbor of one of them to slide in its bearings and forced up by a set screw in combination with the spring that draws it from the other cutter, to prevent the injurious action of the cutting edges on each other, and to admit of their relative adjustment of the two cutters.

A *new* planet, it is said, has lately been discovered. This is not correct, the planet is as 'old as the hills.'

MOUNT HAND.



The above engraving represents a watering place for travellers on the road from the City of Mexico to Santa Fe. In the distance is seen the celebrated *Mount Hand*, so called from the fact that its wonderful apex is the exact profile of a hand. It is considered one of the mosi extraordinary natural curiosities, known to exist on the Western Continent, and excites the astonishment of all. The Mexican muleteers are said to fall on heir knees and cross themselves immediately on coming in sight of El Mano (the hand) which their superstition teaches them to regard with awe.

© 1846 SCIENTIFIC AMERICAN, INC

NEW YORK, NOVEMBER 21, 1846.

Atmospheric Phenomena.

Those who are accustomed to making meteorological observations report the most frequent occurrence within the last three or four months and especially within a few days of the most extraordinary irregularities and apparent convulsions of the atmosphere, ever recorded or probably witnessed. On the 23rd of October these extraordinary indications were noticed in Florida, New York, Flatbush, Syracuse and Montreal. These peculiar indications of the thermometer and other instruments have been such at times as to induce apprehensions of approaching earthquakes, but nothing has yet occurred more serious than the universal prevalence of storms and tempests in all parts of the globe. At the time of this writing the storm continues, which has prevailed about three weeks, insomuch that people are becoming curious to know what kind of weather we shall have next.

Small vs. Large Type.

Most editors of papers think that if they can "set up" their weekly issues in small type, they have reached the ne plus ultra in conferring favors upon their readers. We were formerly of the same opinion, says the Quincy Herald, but were a few years since undeceived. It was during a closely contested election in the State or New York, that we went to the town of Schoharie, to edit a small weekly sheet. Arriving there near the day of publication the "devil" informed us that it would be impossible to "get the paper out in time, and set it up in small type." "Then set it up in Great Primer," (a type used to print handbills with) or the largest type in the office. The "devil" followed our direction, and the paper was duly distributed round town on publication day. Walking down streets not far behind the carrier, we observed him hand a paper to an elderly lady, who exclaimed as we were passing, "La, husband, see what a nice paper we have got this week—I can read it without my spectacles." "Why," observed the old gentleman, "so can I," "I wonder why they dont always print it so," observed the old lady. "Oh, I suppose they can't afford it," replied the old man. We gave up our partiality for Nonpareil, Pearl and Diamond type from that day.

Vegetable Butter.

Butter has hitherto been supposed to be animal matter, and as such has been rejected by some of the Grahamites; but recent investigations have proved that butter may be produced from hay or grass, without depending upon the cow for its preparation, and it is stated that an expert chemist can produce fifteen pounds of butter from a hundred weight of hay being nearly twice as much as can be produced from the milk of a cow during the consumption of an equal quantity of hay as food. We may, therefore expect to see butter factories established in competition with the ordinary dairies.

Gen. Scott in the Cabinet.

It is stated that Gen. Scott, a few days ago, applied to the President for the privilege of heading the army of invasion under the new plan of operations with the land forces but that the Executive declined his application on the ground that the services of the Major General in Chief would be as advantageous to the Government at the war office as at the head of the army.

Price Current in Ohio.

The Germantown, O., Telegraph gives the prices of the following articles at that place. Flour, retail out of the stores $4. Wheat at mills 60c a 65c, corn in ears 20c, oats 15c a 16c flax-seed 60c, rye 40c, timothy seed $1,75, dried apples 27 to 50c, dried peaches $1,25 to $1,50, butter 10c, eggs 7c, cider $1 bbl., potatoes 25c. Beef retail at market 2 a 4c, per pound, tallow 6c.

FOREIGN CORRESPONDENCE.

No. I.

A Glance at the Polytechnic.

LONDON, Oct. 20, 1846.

My dear Sci.

In the multiplicity of London amusements, the Polytechnic Institution claims a prominent place. We have nothing of the kind yet in America and I question if our taste for the strictly scientific is sufficient to sustain one were it now created. This has been in existence only eight years, but long enough to determine its continued future success. It took its rise in opposition to an establishment of similar but inferior kind, the Adelaide Gallery, devoted to exhibitions of models, specimens of the fine arts, disquisitions upon scientific topics, experiments, new inventions and rare shows. This gallery has lately been closed for want of support, occasioned, in a great measure by the presence of a superior rival and its effects scattered to and fro, some of them as far as the American Museum of your city. One of these, a rare copy in marble of Canova's Venus most exquisitely wrought by a distinguished Italian sculptor, is now *en route* for that *ominum gatherum* of modern wonders and antiques, having been purchased by Mr. Barnum at the great Adelaide sale. Though embracing occasional attractions not contemplated in an institution for displaying the results of science and art, the Polytechnic, is in the main, what it professes, a grand depot, where you may see the latest inventions, from rat-traps to atmospheric railways. The *outre* of the whole establishment is conceived in good taste, and conducted far more regularly than is wont to be with show-rooms—with a view to really enlighten the public, as well as to put money in the purse! That it does both I am very sure. Its management consists of a chairman, board of directors, banker and secretary. Connected with its model rooms are departments for the manufacrure of dials, focal glasses of every description, seals, &c., and for the working of various kinds of printing presses on which the catalogues and bills of the Institution are done. These are in the entrance-way to the main hall, which is graced by statues of Lord Bacon meditating corrections in his great work the "Novum Organum;" the famous Duke of Marlborough, Rennie, Canute reproving his flatterers. Besides this entrance hall are thirty-two halls, galleries, class, lecture and exhibition rooms employing a large number of working attendants, and several of the most distinguished scientific lecturers in England. The depth of the building is 320 feet. Forty-five of which are devoted to the entrance hall, called "Manufacturer's room," over which is a theatre or lecture room capable of containing 500 persons, in which lectures on the various branches of Natural Philosophy are delivered and illustrated to the audiences on a most extensive scale. Here also are shown the oxy-hydrogen microscope, dissolving views, dissolving orrery, an apparatus for exhibiting opaque objects, the phisioscope, magnifying the human face to an immense size, well calculated to please beautiful women—a proteoscope, chromatrope, hydro-electric machine and various other apparatus. So far as the scientific exhibition in the theatre is concerned I do not think the dissolving views and microscope so clever as those of the American Museum. English show-men are slow to comprehend the greatest of all sciences—that of humoring the public. If they have a meritorious thing, it must speak for itself. Thus the microscope, which by means of appliances, enlarges the minutest objects 90,000 times on a curtain 27 feet square is exhibited in the dumbest silence. That, of all things the most desirable, the history of the wonderful in nature is left out. The uncultivated eye, whice perceives only form, tells not as it should, how the millions of naturally imperceptible beings that inhabit a single drop of water, are God's servants fulfilling a toil true and beautiful as it is minute. Nor yet very minute if we count the drops that fill the space between the earth's centre and the atmosphere's bound. To me no display of art developing nature can equal the microscope. To behold the process of clarification of air earth and water by atomic scavengers who never fail, and to whom the universe has been partially committed, is a spectacle grander than all the races of mammoths, or even sky piercing stars. There are works to which all men aspire and some useful ones to which none are willing to descend. Human pride looks upon the trivial with contempt, forgetting that particles form worlds. In this, art developes the economy of nature. We behold God descending to create the smallest and meanest things. But with him it is no descent, the minute is equally necessary to the gigantic, and it is only beautiful and brave to compass with the same band both extremes. If man could for a moment forget his pride, foolish as it is vain, this microscope lesson should be of avail.

But, as I said, this best of things is shown in the Polytechnic without comment, and the multitude of heads go away none the wiser, except having seen marvellous many claws twisting and writhing in expanded shadows upon a transparent curtain—and hearts none the better for all they have seen. The Dissolving Views pass in the same cold silence.—Even a little music that would deepen the solitude of the old cathedral, or enliven the showy environs of an oriental palace, is wanting.—The ascent to the theatre is by a broad staircase, at the head of which is a small room devoted to various models, of ships, galleys, and boats. Among them is a Bucentaur of the Venitian Doges; it contrasts strangely with the Royal Barges of modern times, and presents, like all other relics of past ages, save Grecian arts, a striking proof of the progress of mankind.—The main room of the building, however, is the Great Hall, with a dome-roof for its ceiling. This is 120 feet long, 40 wide and 40 high, It leads directly from the entrance hall. In the centre are two Canals, containing a surface of 700 feet of water, to which are attached miniature Dock-yards, constructed by Govment engineers, with an extensive series of locks and water wheels in motion. On the side of one of the canals is an atmospheric railway 78 feet in length, capable of carrying visitors from one end to the other. At the junction of the canals is a large reservoir, into which a diving bell, capable of holding half a dozen persons, which is lowered by means of a crane several feet under water, and supplied with air by powerful pumps so that visitors can descend with the greatest safety. Into this reservoir a man also descends in submarine armor for the purpose of picking up such coins as may be thrown in. It reminded me of the Kidd Salvage Company at Dunderberg. Here also is exhibited the method of blowing up vessals by voltaic electricity, and by means of a patent fuze voltaic lights are represented under water. Three processes of ventillating buildings and ships are comparatively shown, with explanations; also the inclined plane Archimidean screw locomotive, invented by Coleman of Philadelphia, brother to him of Æolian attachment memory. I consider this one of the rarest of all inventions. It at once removes the necessity of a large amount of grading upon rail routes, and from the miniature demonstrations witnessed, I cannot perceive why it is not both safe, sure and sufficient. Around the sides of this hall on the basement floor, are placed the heavier models, such as stoves, engines, &c., and a standing invitation is extended to the public to bring in whatever is new or novel, promising it room, catalogue, and thorough description. By this means all the inventions of the country are secured, and used to a mutual advantage. The processes of bringing cotton from its rudest state to thread ready for weaving, is daily explained; also the Telegraph in its various forms. The catalogue of models and specimens of arts, numbers over 2000, including more simples and eccentricities than would require volumes to describe. —Combined beds and easy rocking chairs, fire escapes, drying machines and mud creepers form, with their surrounding cousins, a brain tableaux sufficient to vex the comprehension of a one day looker on. The drying machine, if it is not already in America, would make the introducer a speedy fortune. It is simple and might attach to a washing machine, making the whole science of clothes cleaning subject to a few feet of space. By this process, cloth taken dripping from the water is dried in two minutes, as completely as under a day's sun. And the beauty of the thing is, that by drying cloth so suddenly, no stains are are left from water settling in spots, as good wash women have ever found the case by the old regimes. I shall not explain the method, which is very simple, because, as a yankee, I have a business notion, if the thing is not already done, to take it up myself,—so look out venders of sunshine and kitchen fires. Around the sides of the hall are galleries, and against the ceilings numberless curious creations of pen, pencil, chisel, and other handicraft. A kind of world microcosm, with every thing whittled down to the smallest available size.—Most beautiful amid all,—lectures, moving shows, dumb signs, and suggestive figures, are crayon representations of the seven Scripture cartoons of Raphael at Hampton Court, fit to have been distended into clouds and pinned up against the sky. S. D. C.

Brick Kilns.

To the Editor of the Scientific American:

At the Farmer's Club or the American Institute on the 10th inst., Dr. Underhill stated many interesting facts showing the destructive effects of the gases from brick kilns on vegetation. For miles in extent these gases prove destructive to the leaves, blossoms and fruit.—They appear to be seriously injurious when the atmosphere is surcharged with moisture and during rain. Professor Mapes attributed the effects to the alum, sulphate of alumina and potash, formed by the gases from the clay, and carried by atmospheric currents over the country.

Questions arise. Do these effects take place from kilns where no coal is mixed with the clay? Cannot some substances be mixed with the clay to neutralise the deleterious qualities? Cannot some of your Scientific Americans inform us? S. F.

[We may not be able to give satisfactory answers to all the questions of our correspondent, for we do not fully understand the premises thereof, which appear to rest in some measure on a certain gentleman's opinion, to say nothing of the statements referred to. We have been accustomed to the vicinity of some of the principal brick making establishments of the United States, but have not witnessed any considerable deleterious effects thereof on vegetation. If such effects appear in some locations, they probably proceed from the presence of nitre, or an excess of sulphur, not usually found combined with clay. If such is the fact, the mixture of lime or any earth containing it, might be expected to neutralise the acids thus produced. By a careful analysis of a sample of the clay used in the kilns referred to, we might determine the more readily, both the cause of the evil complained of, and the most feasible remedy.]—ED,

Willis's Sacred Poems.

Messrs. Clark & Austin, 134 Fulton street, have just published in a beautiful miniature form, the cebrated Sacred Poems of Willis, so well known and appreciated by all. We advise every one that has a taste for reading poetry, to procure a copy of this beautiful edition.

New Factory.

Another steam cotton factory is in progress of erection in Portsmouth N. H. The times are so hard that the people can find no better business than manufacturing cotton goods, notwithstanding the reduced tariff

More Furnaces.

The two large anthracite iron furnaces, recently erected at Allentown, Lehigh county, Pa., were successfully blown in last week by Mr. Benj. Perry and continue to work prosperously.

THE
SCIENTIFIC AMERICAN.

Persons wishing to subscribe for this paper, have only to enclose the amount in a letter directed (post paid) to

MUNN & COMPANY,

Publishers of the Scientific American, New York City.

TERMS.—$2 a year; ONE DOLLAR IN ADVANCE—the remainder in 6 months.

Postmasters are respectfully requested to receive subscriptions for this Paper, to whom a discount of 25 per cent will be allowed.

Any person sending us 4 subscribers for 6 months, shall receive a copy of the paper for he same length of time.

© 1846 SCIENTIFIC AMERICAN, INC

Manufacture of Iron.

A series of Practical Experiments highly interesting to Iron Manufacturers.

BY M. AUG. MALBERG.

[From the Bulletin du Musee del l' Industrie.]

(*Continued from No.* 8.)

In order to form a correct idea of the action of the rollers compared with that of the hammer, relatively to the grain of iron, I made the following experiment :—

After having worked the iron in a puddling furnace, blooms about a foot square were placed one upon the other, and introduced in that position into the welding furnace, and after being sufficiently heated they were forged with a hammer of 1000 lbs. weight into a square bar, of between 5 and 6 inches in breadth.—This bar was afterwards placed in the furnace and well rolled.

On afterwards examining iron manufactured in this manner, it was found, on comparison with that produced by the preceding process, that it was not drawn so well, that its fracture was more granular, and that this texture extended sometimes over the whole sectional surface. This grain, however, was not coarse, but was fine and of good quality, and of a nature to disappear on being again worked, as I was convinced when forging the iron again.—In some places in the bar, the different textures of the two blooms forming the bar could be distinctly seen, the one being of a long fibrous texture, and the other granular. It would seem from this, that the first method was more advantagoous than the second, without reckoning another advantage, which consists in this, that immediately after the first rolling. the bars may be examined, and those of inferior quality placed on one side together; whilst by the latter method, it is only after all the manufacture is completed, and when nothing else remains to be done, that any notion can be formed of the results. It would, therefore, be necessary, that all the pieces which are required to be of a very fibrous or firm texture, should be wrought by the rollers rather than the hammer; as, by the former on the one hand, a more powerful pressure can be exerted than by the latter, and, on the other hand, the drawing out of the grain being effected principally in a longitudinal direction, a more fibrous texture can be obtained

With regard to the relative resistance which iron of a fibrous nature gives, as compared with that of a granular character (the two methods of manufacture above mentioned only being considered), I have found that the tenacity, absolute as well as relative, and also the limit of elasticity, were less in the granular than in the fibrous texture.

The absolute resistance offered by the granular iron, was from 68 to 70 lbs. and the fibrous iron from 72 to 74 lbs. for every 25th of an inch square, the thickness of the bars being 6 1-4 inches by 7 3-4 inches.

As regards relative resistance, the granular is much inferior to the fibrous iron. Thus, in order to break it upon the anvil, fibrous iron required 18 or twenty blows of the hammer, whilst the granular iron required 10 or 12, or at the utmost 15 blows.

The limit of elasticity was generally for the fibrous iron from 32 to 34 lbs. for every 25th of an inch square, and even extended to 38 lbs., whilst for the granular iron it stopped at 30 lbs. The progression of permanent extension, after the limit of elasticity has been exceeded, is not only less in the fibrous iron, but it is also less regular in relation to the weight or force employed. I would also remark that the temperature at which the iron is rolled, and above all, the degree of heat at which it is passed through the two or three last grooves of the rollers, has great influence upon the limit of elasticity. At a red heat, this limit may, for fibrous iron, be made to amount to 40 or 41 lbs. for every 25th of an inch square.

The following data of the difference between rolled and hammered iron were taken from experiments made upon the axles when the Rhine Railway was established.

1st. Nine axles, which had been in use (six being made of hammered and three of rolled iron), were placed upon supports, and a monkey weighing 1412 lbs. was allowed to fall upon them from a height of 16 feet. Of the six made of hammered iron four were broken and two bent, whilst those made of rolled iron were not injured in the least.

2d. Six new axles, five hammered and one rolled, were submitted to the same test. Three of the five hammered axles were broken, and two bent, while the rolled axle was submitted to three blows of the monkey without being at all affected. From these facts the conclusion may be arrived at, that there exists a more intimate combination of the molecular particles in axles of rolled iron than in hammered iron, and also that they possess greater tenacity, while these latter, on the other hand, possess greater rigidity.

3d, With regard to the hammered axles broken under the monkey, whether new or old, they in general presented a more crystaline fracture than the rolled axles, and very frequently flaws and cracks were detected.

4th, The observation has been already made that iron broken with a great weight presents a very different aspect to that broken by a small hammer; but we may add to this, that rolled iron will resist the blows for a length of time, and present a fibrous fracture, whilst the hammered iron presents a fine and somewhat steel like grain, and breaks a long time before the rolled iron.

I will now proceed to the question as to the manner in which iron that has acquired a fibrous texture by the first manufacture may be deteriorated by subsequent operations.

It has been previously stated, that, when the welding heat is too great, the fibrous texture of the iron will be changed into a granular crystaline texture. This transformation may be easily studied by welding two pieces together. I have frequently repeated the experiments which I will now describe, and have invariably observed the following results:

The fractures of two bars of iron, 2 feet in width, and 1 3-8 inch in thickness, on being examined, presented an equally fibrous texture. Their extremities were then hammered at a high temperature, until the thickness was reduced to 3-4 inch, and afterwards brought to a very high welding heat, and welded together by hand. After being left until quite cool, they were struck upon the edge of an anvil, at the welding point. This welding has been completely successful, and even at those points the iron was of a fibrous texture. On cutting through the bar, at a distance of 2 inches from the welding, the texture was still crystalline, but more especially at the edges. At a distance of about three inches the iron was still less crystalline, and at 6 1-2 inches the fibre of the iron was found not to have undergone any change.

In other bars which were cut, the fibre of the iron was found perfect near the welding point, and at not more than 4 or 5 inches therefrom; this arose probably from a less length of bar having been heated.

The conclusion may therefore be drawn, that too high a welding heat will invariably render the iron crystaline; but that, if two bars are welded together, the welded parts will not retain the crystaline form, which arises from the crystaline particles being flattened by the blow of the hammer, and rendered fibrous.—I will not be certain, however, whether the blows of the hammer, which ought only to act upon the welded parts, do not assist in the crystalization of the adjacent parts; but this is certain, that if the phenomena which present themselves on the crystalization of liquid bodies be taken into consideration, for instance, the fact that ice, even in still water is not formed at 5 or 8 degrees below zero, but is formed on the slightest disturbance of the water, it is to be presumed that the shocks produced by the blows of the hammer upon iron heated to a high temperature, and which, in that state approaches the point of fusion, may not be without influence. At any rate a categorical answer to this question is not absolutely necessary for the case in point, and the fact may be considered to be clearly demonstrated, that a strong white welding heat renders fibrous iron crystaline. I have convinced myself of this fact by a great number of experiments, even without having recourse to simultaneous welding.

In these experiments it might be objected that the working of the iron produced the crystaline texture; but I caused bars to be cut which had been worked from a red to a deep orange red, and I found that in the parts worked, the iron fibre, although somewhat shortened, and therefore scarcely perceptible, did not present any absolute alteration in the adjacent parts. It is, however, different with regard to iron worked at a high temperature; the crystaline structure is perceptible in this case, and in a greater degree than in a bar which was simply heated.

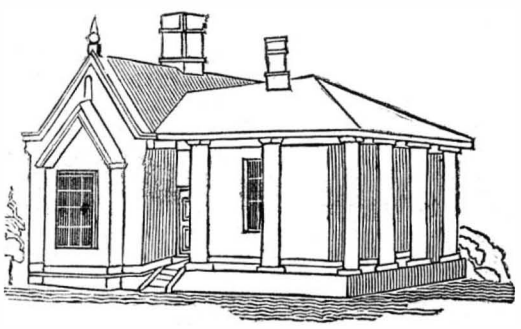
With regard to the resistance of that portion which became granular by the application of a white heat, it appears, from my experiments, to present some analogy with that of the kinds of iron which have remained granular from a previous treatment. It may be, however, that a greater or less degree of white heat has some effect on the quality of the iron. Besides, the temperature at which one sort of iron may be welded is not the same for other sorts. With several kinds, this temperature was so high that the point of fusion was very near the welding point; but, in general, iron of this kind is not fit for welding.

To be continued.

ARCHITECTURE.

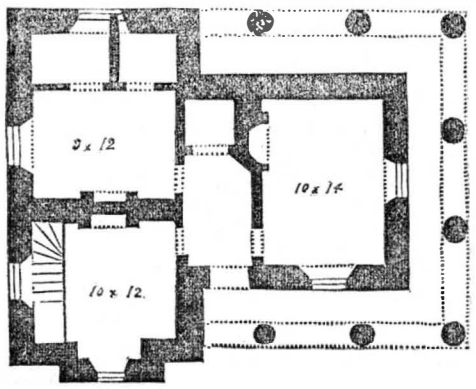
Within a few years past, there have been invented, designed, and introduced in this country, a great variety of models of fancy dwelling houses usually termed cottages, insomuch that in many villages in the eastern states, there is quite a rage for buildings of this kind. We have made arrangements for presenting occasionally, plans and representations of cottages and villas, for the benefit of carpenters, builders, and others interested. We commence with the the following.

FIGURE 1.



The cottage here represented is of singular construction, and shows but little of that balance and regularity which has usually been preferred by Americans. But public taste is constantly changing, and many already prefer the French and other foreign patterns, in cottages as well as in other fabrics. Figure 2, which represents the ground plan, will be readily understood without prrticular reference; the principal entrance being central between the parlor or drawing-room on the right, and the dining-room and kitchen on the left. We object, however, to the apparent deficiency of windows to the drawing-room; but that being a mere matter of taste, builders or proprietors will, in that respect suit themselves.

FIGURE 2.



Our Neighbor-in-law.

If the Editor of the Farmer and Mechanic expects us to answer his article alluding to us, in the ill-natured spirit and style in which it was written, he will find himself mistaken. We like his paper and shall persist in extracting all the useful intelligence we can find in it; and can readily excuse any deficiency in originality which we may find in the "scientific" department thereof. We trust our good neighbor will by his enterprise, assiduity and perseverance continues to improve his paper, and if his mind is intensely fixed on the snbject of "ærial navigation," we will cheerfully furnish him with all the requisite instruction in the best mode of applying and managing his *gas*.

The Hutchinson Family.

The return of these favorite and far-famed singers, to our city, is hailed with manifestations of satisfaction by all the lovers of vocal music. They gave their first concert of the season at the tabernacle on Wednesday evening, to an extensive audience, with abundance of applause. Much more might be said on the subject of the style and melody of the Hutchinson concerts, but as every body is going to hear for themselves, further remarks are needless at present.

Quaint Instructions.

The "Sun," in giving notice of a new arrangement of carriers in a certain section, and anticipating that some of the subscribers would be *missed*, invites those who may "be omitted by the carriers, *to leave their names at the office*." This reminds us of a guide post which we have seen represented in a landscape, and on the board of which was written, "This road goes to nowhere; t'other one goes to Hampton; if ye can't read, inquire at the blacksmiths' shop."

Santa Anna.

By recent accounts from Mexico, it appears that this milliary *genius* has adopted a more ready method of raising funds than that pursued by our Government. Falling in with a *conducta* of specie, while on his way to San Luis Potosi, he seized it on the plea that it was not safe and proper to risk specie at sea under existing circumstances; thus putting himself in possession of about two millions of dollars.

Navigation Impeded.

A telegraph report from Boston on Monday last says. "Our harbor presents a very unusual appearance, We have over 300 vessels ready for sea, and all wind bound. The sound and harbors of Cape Cod are also filled with packets for the South, all waiting for the wind. Forty schooners and sloops from New-York for Boston, are at anchor near Hart's Island."

Magnetic Telegraph.

It has been recommended by some of the merchants of this city, that when Congress meet, they take measures to place the control of all the direct routes of the Electric Telegraph in the hands of the General Government.

Post-Office Reform.

We are informed that the Postmasters throughout the country, directing them, as they value their offices, to be attentive to their business, and perform their duties personally as much as possible, and not have them performed by any deputies, no matter how careful or faithful.

© 1846 SCIENTIFIC AMERICAN, INC

"What they say of us."

In giving place to the following notices from the Press, we feel it our duty to state that the flattering success which has attended this journal since its commencement has been due, in a great measure, to the generous encouragement of our highly respected cotemporaries.—They have brought us before the public, *made us known*, a desiratum sought for by all yet obtained by few, and for which we return our warmest thanks. We have before us several columns of 'first rate notices' taken from our numerous exchanges, and feel inclined to publish them all at once; but space will not admit. Occasionally, however, we intend to copy a few into our paper, solely with a view that our readers may sometimes know "what they say of us."

—

THE SCIENTIFIC AMERICAN.—We take great pleasure in recommending this excellent paper to the patronage of the mechanic. It is just entering upon its second volume, after a year of glorious prosperity. There is no work within our knowledge so eminently useful to the scientific man as this weekly paper. Every number contains several diagrams of new inventions in mechanics and science, with full descriptions, so that the reader has furnished him, much useful information on all subjects in any way connected with the arts. The publishers are in correspondence with all the prominent scientific institutions of the day, and are thus prepared to furnish the earliest intelligence of all new inventions. The American is published by Munn & Co., N. Y., at $2 a year—$1 in advance.—*Iris & Odd-fellow's Mirror, Balt., Md,*

We refer to the prospectus of the Scientific American in another column. It is an excellent work and should be in the hands of every mechanic and common school teacher in the Union.—*Democrat, Wooster, Ohio.*

SCIENTIFIC AMERICAN.—Without any disposition to puff one paper at the expense of another, we must take the liberty of stating that a paper bearing the above title is published by MUNN & Co. N, Y., and that it is a very excellent paper, being the "Advocate of Industry and Journal of Scientific, Mechanical and other Improvement." it is published in quarto form, convenient for binding and is illustrated with a great number of appropriate engravings. It is just entering upon its second volume. A specimen can be seen at this office.—*Gazette, Zanesville, Ohio.*

☞The "*Scientific American,*" and Advocate of Industry and Journal of Scientific, Mechanical and other improvements, a weekly paper published in N. Y. by MUNN & Co., is one of the best papers of the kind published in the country; it has numerous engravings illustrating the subject on which it treats. It is published in quarto form at the rate of $2. per annum. Now is an excellent time to subscribe as it is just entered on a new volume. A specimen number can be seen at this office.—*Observer, Erie, Pa.*

THE SCIENTIFIC AMERICAN comes to us enlarged and improved. It is now printed in quarto form with new type and new engravings. Every mechanic, who wishes to acquire scientific knowledge, should subscribe, pay for, and read the American. It is one of the best papers of its class in this country.—*Republican, Chester, Pa.*

THE SCIENTIFIC AMERICAN.—This popular journal has lately been enlarged and improved, and is now one of the most valuable papers for mechanics, published. The editor Rufus Porter is known as one of the most scientific men in the country. Our young mechanics who hope to rise in the world should take this paper by all means. Cook in Broadway is the agent.—*Knickerbocker, Albany N. Y.*

THE SCIENTIFIC AMERICAN is the best paper within our knowledge for mechanics and all who wish to obtain a knowledge of the progress of the mechanic arts, discoveries in science, &c. It is edited with much ability by Rufus Porter, N. Y.—is illustrated with numerous engravings and afforded weekly at the low price of $2. per annum. A new volume is just commencing in quarto form.—*Cultivator Columbus, Ohio.*

☞The N. Y. Scientific American is now published in quarto form and is as worthy of a liberal support as ever. It should be patronised by every mechanic in the Union and by all who feel interested in the progress of the mechanic arts. It is published for $2 per annum.—*Democrat, Greenfield, Vt.*

THE SCIENTIFIC AMERICAN.—This truly excellent paper has been enlarged and otherwise improved with the commencement of the 2d volume. It is printed upon an intire new font of type and presents a very neat appearance.—In addition to this it is now published in a quarto form so as to be convenient for binding, a great desideratum, as we dont know of a paper as well worthy of preservation as the Scientific American To the mechanic, farmer and indeed every scientific and practical man, whatever his vocation, it is an invaluable paper and the exceedingly cheap rate at which it is published, $2 per year, places it within the reach of every one. Munn & Co. publishers N. Y.—*Eagle Greenwich N. Y.*

☞The first number of the second volume of the Scientific American comes to us in quarto form, convenient for preservation, and an entire new, neat and tidy dress. The Sci-Am. is now one of the most valuable papers that come to us. Mechanics and others are respectfully invited to call and examine specimen numbers at this office.—*Chrystal Fount N. Y.*

☞The New York Scientific American has been greatly improved in size, appearance and matter. It is decidenly one of the most useful of our exchanges; and we have cheerfully transferred to our columes its new prospectus, to which we would call the attention of our readers. No mechanic should be without it. We would not be deprived of its weekly visits for double the subscription price, and feel grateful for the even exchange during the past year. Persons wishing to see a copy will call at our office. The price is $2 a year—one half in advance.—*Gazette, Germantown Ohio*

"The Scientific American" published in New York city has recently been enlarged and is now issued in a suitable and convenient form for binding. It is a highly interesting and valuable paper, and contains much information which should be in the posession of every mechanic as well as scientific man, and which cannot be found in the ordinary newspapers of the day. We commend it to public favor. —*Safeguard, Po'keepsie, N. Y.*

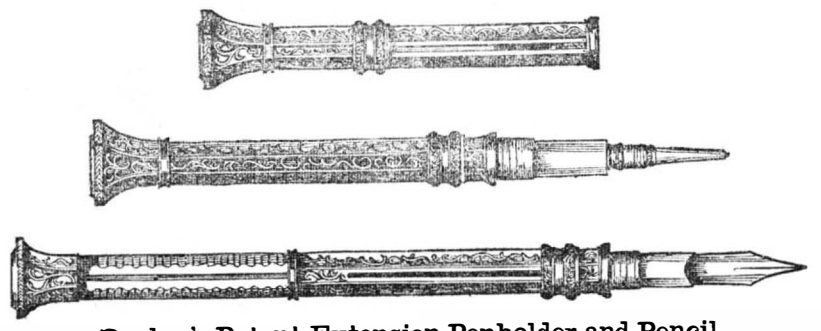
THE SCIENTIFIC AMERICAN.—This able and deserving popular sheet has now reached the fourth number of its second volume. It is one of our best exchanges and deserves a wide circulation, which we hope it will receive.—*Cultivator, Hallowell, Me.*

THE SCIENTIFIC AMERICAN.—This is a paper which should be in the hands of every mechanic. It has just entered upon its second year and is issued in a quarto form. It is a well filled and neatly printed sheet. Its contents are purely of a character to enlighten as well as amuse. In fact we know of no paper of its size which is worth so much. Terms, $2, per annum in advance.—*Citizen, Paper Mill Village, N. H.*

THE SCIENTIFIC AMERICAN.—We have had frequent calls to subscribe for this excellent paper since we noticed it, people thinking we are agents. Such is not the case. Our own large business is more than enough. We advertise the Scientific American because we think it just such a paper as mechanics and artists need. Gentlemen wishing it have only to enclose two dollars in a letter directed to Munn & Co., publishers, 128 Fulton st, N. Y. and the paper will be forthcoming.—*Olive Branch, Boston Mass.*

☞The Scientific American is the best paper of the kind in the United States. Every scientific man—every mechanic ought to have it. The paper can be seen at our office. We will take the names of any who wish to take it. It is published by Munn and Co., New-York, at Two Dollars a year—One Dollar in advance and the remainder in six months.—*Gazette, Clarendon Ohio.*

☞The N, Y. Scientific American—a most valuable paper for mechanics, has commenced the 2d volume, enlarged and otherwise improved.—*Palladium, Manchester, N. H.*



Bagley's Patent Extension Penholder and Pencil.

THIS is the most compact, complete, convenient and useful pocket companion ever offered to the public. The multiplicity of its usefulness and the smallness of its size, renders it a perfect MULTUM IN PARVO.

In the short space of 2 3-4 inches is contained a Pen, Pencil, and a reserve of leads, and by one motion slides either the pen or the pencil out and extends the holder to six inches, which is but little more than half the length, when shut up, of the common pen holder, but when extended is one fourth longer. This article is secured by two patents, and the Manufacturers are now ready to receive orders for them in any quantity, either of Gold or Silver, together with his celebrated ever pointed Gold Pens, which need no proof of their superiority except the increased demand for the last six years, and the numerous attempts at imitation.

A. G. BAGLEY, No. 189 Broadway.
New York, Sept. 1, 1846. o24 tf

BREWER VILLAGE, (Me.) Nov. 13, 1846.

Mr. Editor:

I have attached to ahe Melodeon, a finger board in such a manner as to enable the performer to play the transpositions of the scale, without the use of the short keys. With this arrangement the beginner finds no more difficulty in the transpositions than in the natural key. It also facilitates the performance of quick music.

If any of your readers should consider it an improvement, and wish to secure the same to themselves, they have only to address the subscriber, who wifl forward a full description

Respectfully, C. J. BREWER.

WOONSOCKER, Nov. 16, 1846.

Mr. Editor.

Suppose a globe that would hold a quart, filled half full of water and mounted on its poles or axles, and thus, having an air tight valve, should have a sufficient quantity of air pumped into it to cause the water to float and rise to the upper section of the globe The globe would of course become top heavy and would change its position. Thus having a propelling power within itself, would it not constitute a perpetual motion? M. K.

Our correspondent would find it difficult to show a reason why the water should take the upper section, unless the air was compressed to such density as to be actually heavier than the water: and if that was actually the case, the water being the lightest of the two fluids, the globe could not become top heavy as he supposes.

ADVERTISEMENTS.

☞This paper circulates in every State in the Union, and is seen principally by mechanics and manufacturers. Hence it may be considered the best medium of advertising, for those who import or manufacture machinery, mechanics tools, or such wares and materials as are generally used by those classes. The few advertisements in this paper are regarded with much more attention than those in closely printed dailies.

Advertisements are inserted in this paper at the following rates:

One square, of eight lines one insertion,		$ 0 50
" " " "	two do.,	75
" " " "	three do.,	1 00
" " " "	one month,	1 25
" " " "	three do.,	3 75
" " " "	six do.,	7 50
" " " "	twelve do.,	15 00

TERMS:—CASH IN ADVANCE.

Branwhite's Patent Color Discriminator.

☞This ingenious invention consists of a neat box in which are arranged in a scientific manner, all the most brilliant colors, THIRTY FIVE IN NUMBER, represented by as many convex discs of the FINEST SILK. Each disc bears a number referring to an explanatory scale. The attention of storekeepers, milliners, and indeed all who have occasion to vend or purchase colored articles of any kind, is respectfully invited to this new and valuable discovery. More trouble can be saved by its use in ONE DAY than four times the amount of its cost. For sale, wholesale and retail, at the office of the Scientific American, 128 Fulton st., 3 doors from the Sun Office.

They may be sent by Express, to any part of the United States. oct31 tf

Engraving on Wood

NEATLY AND PROMPTLY EXECUTED AT the OFFICE OF THE SCIENTIFIC AMERICAN, 128 Fulton st, three doors from the Sun Office. Designs, DRAWINGS of all kinds for PATENTS, &c., also made, as above, at very low charges. 1

GENERAL AGENTS
FOR THE SCIENTIFIC AMERICAN.

New York City,	GEO. DEXTER.
" "	WM. TAYLOR & Co.
Boston,	Messrs. HOTCHKISS & Co.
Philadelphia,	Messrs. COLON & ADRIANCE.
Boston,	Jordon & Wiley.

LOCAL AGENTS.

Albany,	PETER COOK.
Baltimore, Md.,	S. SANDS.
Cabotville, Mass.,	E. F. BROWN.
Hartford, Ct.,	E. H. BOWERS.
Lynn, Mass,	J. E. F. MARSH.
Middletown, Ct.,	WM. WOODWARD.
Norwich, Ct.,	SAFFORD & PARKS.
New Haven, Ct.,	E. DOWNES.
New Bedford, Mass.,	WM. ROBINSON & Co.
Newark, N. J.,	J. L. AGENS.
Newark, N. J.	Robert Kashaw.
Providence, R. I.,	H. & J. S. ROWE.
Springfield, Mass.,	WM. B. BROCKET.
Salem, Mass.,	L. CHANDLER.
Saco, Me.,	ISAAC CROOKER.
Troy, N. Y.,	A. SMITH.
Taunton, Mass.,	W. P. SEAVER.
Worcester, Mass.,	S. THOMPSON.
Williamsburgh,	J. C. Gander.

TRAVELLING AGENTS.

O. D. DAVIS, JOHN STOUGHTON, SYLVESTER DIERFENORF.

CITY CARRIERS.

CLARK SELLECK, SQUIRE SELLECK, NATHAN SELLECK.

Persons residing in the city or Brooklyn, can have the paper left at their residences regularly, by sending their address to the office, 128 Fulton st.. 2d floor.

ELECTRICITY.

SMITH'S CELEBRATED TORPEDO, OR VIBRATING ELECTRO MAGNETIC MACHINE—This instrument differs from those in ordinary use, by having a third connection with the battery, rendering them much more powerful and beneficial. As a CURIOUS ELECTRICAL MACHINE, they should be in the possession of every one, while their wonderful efficacy as a medical agent, renders them invaluable. They are used with extraordinary success, for the following maladies.

RHEUMATISM—Palsy, curvature of the Spine, Chronic Diseases, Tic-doloureaux, Paralysis Tubercula of the brain, heart, liver, spleen, kidneys, sick-headache.

TOOTHACHE—St Vitus dance, Epilepsy, Fevers, diseases of the eye, nose, antrum, throat, muscles, cholera, all diseses of the skin, face, &c.

DEAFNESS—Loss of voice, Bronchitis, Hooping cough.

These machines are perfectly simple and conveniently managed. The whole apparatus is contained in a little box 8 inches long, by 4 wide and deep. They may be easily sent to any part of the United States. To be had at the office of the Scientific American, 128 Fulton st, 2nd floor, (Sun building) where they may be seen IN OPERATION, at all times of the day and evening. 2

G. Marsh & Co.

Manufacturers of Tin Cylinders for SPINNING FRAMES.

PALMER, MASSACHUSETTS.

n21 4t*

COPPER SMITH!—The subscriber takes this method of informing the public that he is manufacturing Copper Work of every description. Particular attention is given to making and repairing LOCOMOTIVE tubes. Those at a distance, can have any kind of work made to drawings, and may ascertain costs, &c., by addressing L. R. BAILEY, cor. of West and Franklin sts., N. Y.

N. B.—Work shipped to any part of the country. 45to2dv18*

BRASS FOUNDRY.

JAMES KENNEARD & CO. respectfully inform their friends and the public that they are prepared to furnish all orders for Brass and Composition Castings, and finishing in general at the shortest possible notice.

N. B. All orders for Rail Road, Factory and Steamboat work from any distance, will be thankfully received and attended to with despatch and on reasonable terms.

☞Patterns made to order.

JAMES KENNEARD & CO.
oct. 10 3m* 27 1-2 Chrystie st. New York.

AMERICAN AND FOREIGN PATENT AGENCY,

No. 23 Chambers street, New York.

JOSEPH H. BAILEY, Engineer and Agent for procuring Patents, will prepare all the necessary Specifications, Drawings, &c. for applicants for Patents, in the United States or Europe. Having the experience of a number of years in the business, and being connected with a gentleman of high character and ability in England, he has facilities for enabling inventors to obtain their Patents at home or abroad, with the least expense and trouble.

The subscriber, being practically acquainted with all the various kinds of Drawing used, is able to represent Machinery, Inventions, or Designs of any kind, either by Authographic Drawing, or in Isometrical, Parallel, or True Perspective, at any angle best calculated to show the construction of the Machinery or Design patented.

To those desiring Drawings or Specifications, Mr. B. has he pleasure of referring to Gen. Wm. Gibbs McNiel, Civil Engineer, Prof. Renwick, Columbia College, Prof. Morse, Jno. Lee.

Residence, No. 10 Carroll Place; office, No. 23 Chambers street. oct10 tf

© 1846 SCIENTIFIC AMERICAN, INC

The Manufacture of Glass.

BY MR PELLATT.

Before considering the manufacture of glass it is necessary to say a few words respecting the mode of preparing the crucibles and furnaces for melting the materials. Every glass maker is his own potter and furnace builder.—The preparation of the crucibles involves the greatest care, because upon the quality of them depends all the after processes and results.—The material used is fire clay. The clay best suited is that which contains the most silica. The crucibles or pots are made by forming the clay into small rolls, which are spread, layer over layer, with considerable pressure; the whole is thus built up little by little, allowing the clay to harden, so that the shape is preserved. During the building and afterwards, the pots are in a room in which the temperature is regulated at about 60 deg., and all draughts are excluded; five or six months are required in this temperature to dry them. The reason of so much care is to exclude as much air from the clay as possible: which, if it existed in quantity, would, upon the pot being brought into contact with the high temperature of the glass furnace, become so expanded as to burst and also to insure a capacity to the pot to withstand the sudden contraction and expansion to which it is exposed, Pots are of different constructions—closed and open; the former is only used for flint glass, the latter for all other descriptions in both shapes. The upper part is the most capacious; the reason for this is, that the heat reverberates from the top of the crown of the furnace upon the top of the pots. The pots cannot of course be exposed *cold* to the heat of the furnace, but have to undergo a gradual heating until they attain a white heat, and this is done in a furnace constructed for the purpose from which all air is carefully excluded, from this furnace they are removed upon iron carriages to the glass furnace. The heat required to melt glass, especially that made without lead is very great, yet on account of the danger to the crucibles from any sudden rush of air, it is impossible to make use of blast or even fanners, the proper draught is secured by the construction of an air funnel called a cave, and by having the glass house so constructed that it can be closed from the entrance of external air above. Upon the arch of the cave the furnace floor or seige, (from the French *siege*, seat of the pots,) is constructed, made of strong heavy square bricks. The round furnace is used for flint glass, the flames finding vent by flues passing through the pillars of the furnace, having chimneys upon the outside for carrying off the smoke. Square furnaces, again, are employed for glasses without lead, a greater heat being required, which is obtained by the grate-room running the whole length of the seige. The proper construction of the furnace is of great importance to the operations of the glass-maker; in fact, good glass cannot be made without a good furnace. There are several distinct varieties of glass manufactured and so different are they, both in preperation and manipulation that they may be considered seperate manufactures.—There are, however' only two methods by which fluid or semi-fluid glass is formed to shape, viz.—casting and blowing. Casting applies *exclusively* to *plate* glass, and is the emptying the glass out of the pot by casting it out upon a table; the casting of glass as metal is cast being yet unpractised, *applies* to *all* other descriptions of glass.

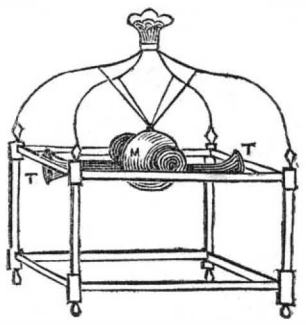
The tools used by the glass maker are simple; the blowing iron—simply a hollow tube; with this the semi-liquid glass is gathered from the pot and blown out into shape; the punty for attaching to the bottom of glass after blowing, so that the blowing iron may be detached, and the glass being heated up may be cut with scissors and afterwards formed. The shears or procellos for shaping the glass whilst it is turned by the workman upon the arms of his chair or work-bench. These, with the addition of a pair of scissors and pincers, are the whole of the tools.

To be continued.

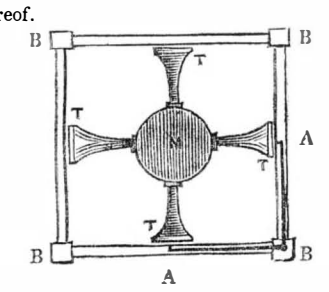
A Nice Point in Philosophy.

The following problem has never before been published in this country, and we believe there are very few even in this country, capable of giving a correct solution; but we shall leave the problem unanswered till our 11th number, for the purpose of giving others an opportunity of communicating answers (postage paid) which will be noticed with due credit. PROBLEM: A sloop rigged vessel has a straight hollow mast which stands perfectly perpendicular, and is 100 feet high. The vessel is sailing on a perfectly smooth sea, at the rate of 600 feet per minute; then if a small leaden ball be let fall from the centre of the mast head, at what point will it strike the bottom,—at the centre of the mast, or at what distance and direction from that centre?

The Invisible Lady.



Among the many wonderful inventions which have been introduced for the purpose of exciting and gratifying curiosity, none have appeared more mysterious and unaccountable than the philosophhical arrangement which constitutes what is sometimes exhibited under the appellative of the "Invisible Lady." A perspective view of the only visible part of the apparatus, is shown at the head of this article; and in the following cut is seen the plan thereof.



A light square frame about four feet in diameter and three feet high, consists of four small posts B B B B, which are connected by slender beams above and below, and from the heads of the four posts, four bent wires ascend and are united at the top, thus forming an apex. A hollow copper ball M, about ten inches in diameter, is suspended from these wires by four slender threads or ribbons, and to the sides of the ball are attached four hollow trumpets T T T T, with their mouths outwards, but not coming in contact with any part of the frame. This apparatus appears to be a portable affair, which might occupy one place as well as another: and the peculiarities of it are such, that any question asked by a spectator, speaking into the mouth of one of the trumpets, either by the full voice or a whisper, is readily answered by a musical lady's voice from the centre of the ball, and which may be heard through all the trumpets at the same time. The invisible lady will also sing melodiously when required, and her answers to questions, or remarks in conversation are such as to evince a knowledge of the appearance of the person with whom she converses. Now for the secret. In two of the horizontal railings or beams A A, opposite the trumpet mouths, there are apertures which commnnicate with small pipes which unite at the post, and descending through the post and the floor, pass to another apartment where the real invisible lady sits, in a position from which she can observe through a concealed aperture in the ceiling, the persons of the spectators. She hears the questions, and answers through the invisible pipes, and her voice being reflected by the hollow ball, is heard at the mouths of the trumpets, as though it proceeded from the interior of the ball.

Every human body contains two hundred and forty bones. These appears to have been no improvement in this machine since its first invention.

Silent Carriage Wheels.

About five years ago, we published in the "N. Y. Mechanic," a proposition for the introduction, and a description of a mode of construction of carriage wheels, which should run silently over the paved streets of the city; but no person here appeared to regard it. We are now informed by English papers that some of the carriage makers in London have adopted the plan which we recommended, and that carriages with wheels of this description are running in the streets of that city, and are much approved. The tire of the wheels consists of a thin iron plate, covered and enclosed in a band of Indian rubber about an inch in thickness; and this is covered and protected by stout leather, the edges of which are nailed to the sides of the rim or felloes. The leather being thus pliable. will not readily chafe or wear out, and the motion of the carriage is so smooth and agreeable, that should an omnibus be introduced with such wheels in this city, it would be crowded with passengers, even at double the regular price.

Earthquakes.

The Philadelphia North American remarks that there can be but little doubt that the earthquake on the morning of the 25th of August, felt in Massachusetts, proceeded from the eruption of Hecla, at noon on the 22d.—The distance, we presume, is about 25 geographical degress, so that the vibration or pulsation travelled at the rate of 24 miles per hour. Now we have no knowledge of the actual rapidity with which the vibrations of an earthquake travel, but 24 miles an hour appears to us to be slow travelling in these days of railroads and Magnetic Telegraphs. If this is all earthquakes can do in the hour, why, then it must be said they are decidedly "no great shakes."

Gun Cotton.

The experiments on this article in Washington are said to be decidedly successful.—They are making preparations to test it on a grand scale. Gen. Jackson was the first to introduce the use of cotton into military operations; but the recent discovery contemplates a very different application, and the prepared gun-cotton would be rather an unsafe material for breast-works of a fortification.

A New Fsshioned Boat.

The St. Souis Reveille of the arrival at that place of a steam-boat called the Muscle, of unusual construction. She is constructed with a broad bow, strongly timbered and draws only twenty inches water It dont matter which end of her they put foremost for both are alike but she is said to be a safe boat and runs with good speed.

To Correspondents.

"Novelty."—The following is Redfield's rule for computing the tonnage of steam vessels.—"Multiply the length between the perpendiculars (reckoned from the rabbits of the stem and sternpost at the level of the deck) by the full breadth of the hull at amidships, and the product by the central depth from the top of the floor timbers, or of the ceiling thereon: divide this product by 100 by separating the two right hand figures, and the quotient may represent the corventional or approximate tonnage."

"O. D. M."—The substance you refer to is a mineral called *Asbestos*, of which Amianthus is one of its principal species. It is incombustible in its nature, and consists of elastic fibres somewhat unctuous to the touch and translucent. The ancients manufactured cloth from the Asbestos stone, in which they wrapped the bodies of the dead when exposed on the funeral pile, for the purpose of preserving them. It is found in many places in Europe and Asia.

"A. H."—See No. 23, first volume of the Scientific American.

"Young Mechanic."—*Blanching*, is the art of making anything white, as (in horticulture,) the method of whitening salads. Blanching money is the annealing, boiling and cleansing it when it is coined. Blanching copper is done in various ways, so as to make it resemble silver. Blanching is also the operation of covering iron with a thin coat of tin.—Blanching almonds is the skinning them by means of hot water.

"Philosophy."—Yes, echoing bodies may be so contrived as to repeat the echo several times, but your plan is wholly contrary to the laws of sound; hence your unsuccessfulness. At Milan there is said to be an echo, which reiterates the report of a pistol fifty six times, and if the discharge be very loud, the repetition exceeds that number. The celebrated echo at Woodstock, in Oxfordshire, England, repeats the same sound fifty times. But the most singular echo, is that near Rosneath, a few miles from Glasgow, Scotland. If a person placed at a proper distance from the echo, plays eight or ten notes with a trumpet, they are correctly repeated, but a third lower; after a short pause another repetition is heard in a lower tone; and then, after another interval, a third repetition follows in a still lower tone.

"Stewart."—We decline publishing your communication,

"C."—Your idea is correct, though not properly explained.

"G. M.—Kingston."—The finest kind of Porcelain earth is found in China. After being beaten it is steeped in water; a kind of cream is then formed on the top, and a grosser substance at the bottom, the former of which is used for the finest kind of ware or china, and the latter for the coarser sort.

"A. E. B."—The effect you speak of is produced by a contrivance called a Multiplying Glass, otherwise a polyhedron. This consists of a piece of glass ground into several planes that make angles with each other and cause objects to appear increased in number.

We have received a variety of other communications, from various sections, requiring intelligence on mechanical principles, new machinery &c., which will be attended to as early as we can find time to prepare and furnish the information required.

THE NEW YORK
SCIENTIFIC AMERICAN:
Published Weekly at 128 *Fulton Street.*,
(*Sun Building*,) *New York.*

BY MUNN & COMPANY.

The SCIENTIFIC AMERICAN is the Advocate of Industry and Journal of Mechanical and other Improvements: as such its contents are probably more varied and interesting, than those of any other weekly newspaper in the United States, and certainly more useful. It contains as much interesting Intelligence as six ordinary daily papers, while for *real benefit*, it is unequalled by any thing yet published Each number regularly contains from THREE to SIX ORIGINAL ENGRAVINGS, illustrated by NEW INVENTIONS, American and Foreign,—SCIENTIFIC PRINCIPLES and CURIOSITIES,—Notices of the progress of Mechanical and other Scientific Improvements, Scientific Essays on the principles of the Sciences of MECHANICS, CHEMISTRY and ARCHITECTURE,—Catalogues of American Patents,—INSTRUCTION in various ARTS and TRADES, *with engravings*,—Curious Philosophical Experiments,—the latest RAIL ROAD INTELLIGENCE in EUROPE and AMERICA,—Valuable information on the Art of GARDENING, &c. &c.

This paper is especially entitled to the patronage of MECHANICS and MANUFACTURERS, being devoted to the interests of those classes. It is particularly useful to FARMERS, as it will not only apprise them of IMPROVEMENTS in AGRICULTURAL IMPLEMENTS, but INSTRUCT them in various MECHANICAL TRADES, and guard against impositions. As a FAMILY NEWSPAPER, it will convey more USEFUL Intelligence to children and young people, than five times its cost in school instruction.

Being published in QUARTO FORM, it is conveniently adapted to PRESERVATION and BINDING.

TERMS.—The Scientific American is sent to subscribers in the country at the rate of $2 a year, ONE DOLLAR IN ADVANCE, the remainder in 6 months. Persons desiring to subscribe, have only to enclose the amount in a letter, directed to

MUNN & COMPANY,
Publishers of the Scientific American, New York.

☞ Specimen copies sent when desired. All letters must be POST PAID.

© 1846 SCIENTIFIC AMERICAN, INC